NORTHEAST NEIGHBORHOOD
SPECIFIC INVENTORY AND RESOURCE ANALYSIS

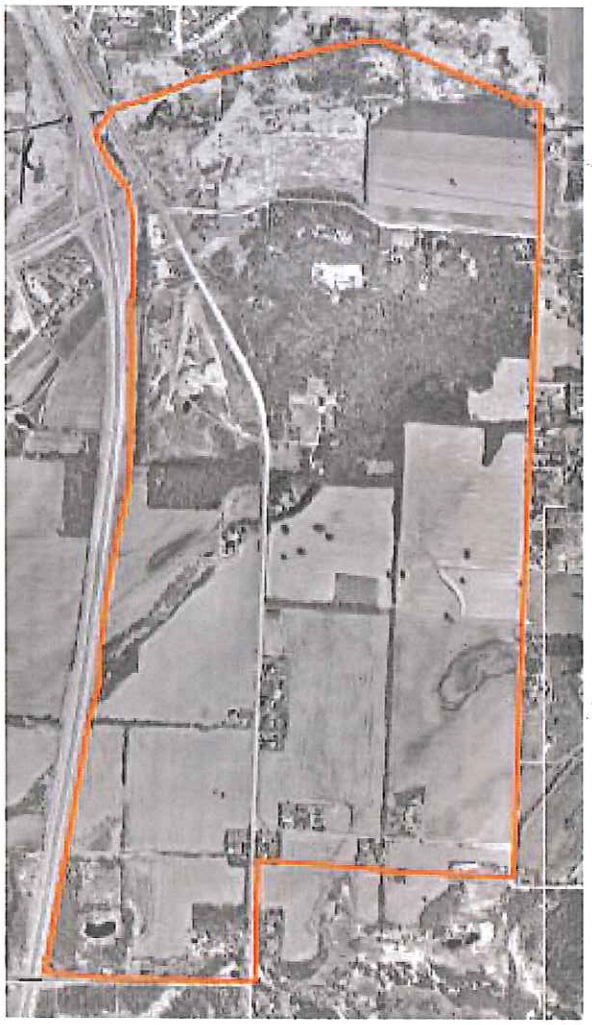
CITY OF FITCHBURG
DANE COUNTY, WISCONSIN

RUEKERT/MIELKE
W233 N2080 Ridgeview Parkway
Waukesha, Wisconsin 53188

Specific Inventory and Resource Analysis
Northeast Neighborhood
City of Fitchburg

Background

The Northeast Neighborhood was identified as a cohesive neighborhood with development potential through the Future Urban Development Area study (FUDA) in 2004 based on its proximity to the City of Madison, vehicle and bicycle transportation corridors, and the ability of the City to provide infrastructure for public services. Future development is possible in the Northeast Neighborhood only after the City adopts a neighborhood land use plan and approves the Urban Service Area.

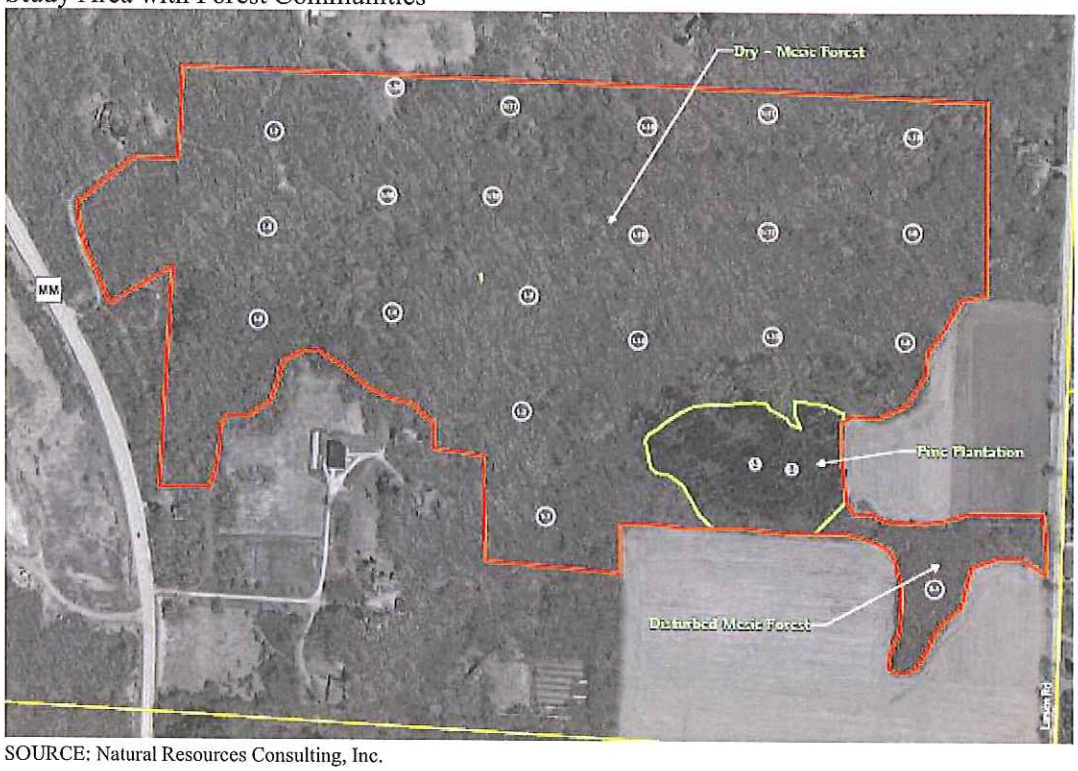


The Northeast Neighborhood is located in the northeast portion of the City of Fitchburg, adjacent to the City of Madison, Town of Blooming Grove, and the Town of Dunn. Boundaries of the neighborhood include Larsen Road, Nine Springs Creek, USH 14, and the Lacy Road/Goodland Park Road corridor. It encompasses approximately 868 acres, or slightly under 1.4 square miles.

In 2005 a process began to study appropriate future land uses within the neighborhood. Natural and man-made limitations identified through the neighborhood planning process resulted in a more detailed analysis of the neighborhood including a conceptual storm water management study, an internal analysis of the water supply system, a traffic study, and this Specific Inventory and Resource Analysis.

This Specific Inventory and Resource Analysis is part of the overall planning process for the Northeast Neighborhood that includes the heavily wooded area in the northern portion of the neighborhood. The boundaries of the study area consisted of those properties within the wooded area on which the property owners granted access permission. Concerns that surfaced at the Public Hearing for the Northeast Neighborhood Land Use Plan became the genesis of this study. More specifically, this Specific Inventory and Resource Analysis is to address the potential for future development within the woodlot in the northern portion of the neighborhood and an identification of the heritage trees for the City of Fitchburg Parks Department.

Study Area with Forest Communities



SOURCE: Natural Resources Consulting, Inc.

The purpose of the Specific Inventory and Resource Analysis is to identify the environmental significance of the natural features within the woodlot, the potential impacts of development on these resources, and parameters or conditions that must be followed for development to occur in a manner that is sensitive to the natural environment.

The City of Fitchburg contracted with Ruekert-Mielke, a municipal consulting firm, to prepare the Specific Inventory and Resource Analysis for the woodlot within the Northeast Neighborhood. Ruekert-Mielke teamed with Natural Resources Consulting, Inc. (NRC) to complete the fieldwork and sampling that comprised the initial phases of the project. An overview of the natural resource inventory follows with an analysis regarding the appropriateness of future development within the study area. Please see Appendix A for the complete Northeast Neighborhood Specific Inventory and Resource Analysis, fieldwork, and sampling data.

The Specific Inventory and Resource Analysis includes an array of natural features to be studied and identified, including the trees, woody and herbaceous plants, slope and soil erosion capability, soil moisture and nutrient regime, landforms, native animal species, threatened or endangered species, ecological habitat, and any other significant features or resources.

Tree Inventory

A tree inventory was completed for the woodlot in the Northeast Neighborhood from a sampling of locations throughout the woodlot. The sampling locations consisted of areas roughly 50-feet in diameter where all trees with a diameter at breast height (dbh) greater than 4" were measured, analyzed, and documented. The tree inventory includes tree species, size, crown class, and an assessment of the health of each tree. The study area was divided into three separate tree communities that represent the entire woodlot. Each of the communities has specific characteristics that represent the growing conditions of the trees and plants. The three communities include a dry mesic forest, pine plantation, and disturbed mesic forest.

1. Dry Mesic Forest

Background Information

The majority of the study area has been identified as a dry mesic forest. The dry mesic forest is approximately 60 acres. A mesic upland forest typically grows on hilly or sloping areas on moderately moist soils with high nutrient content. A dry mesic forest then, is typically known as an upland forest that is slightly drier than a mesic forest, and that has a canopy that is more open than a typical mesic upland forest.

Analysis

Twenty sampling locations were established throughout the dry mesic forest community with 130 live trees studied and analyzed. A wide variety of trees were sampled in the species, size, and crown class; however, the canopy is dominated by large white, red, and bur oak trees ranging in size from three to 50 inches in diameter at breast height.

The most prevalent tree species indicated in the sampling of the dry mesic forest include black cherry, white oak, shagbark hickory, box elder, and black locust. Each of the five most prevalent tree species accounted for at least ten percent of the tree cover.

Of the 130 trees identified in the sampling, only fifteen percent of the trees where identified as non-native species. These species included black locust (10%) and common buckthorn (5%).

Overall, there is nearly an even ratio of the desirable and undesirable trees in the dry mesic forest community. In terms of development impact, for the purpose of this study a desirable tree is defined as a healthy non-invasive native tree that is worthy of preservation because it contributes to the environmental significance of the woodland community. Many of the desirable tree species have been indicated to be in good health, with some exceptions. The trees considered to be undesirable were those species identified as non-native or invasive, and those having unsightly characteristics including bent structure, many dead branches, and side sprouts.

Using the diameter at breast height, the trees can be placed into separate classes. Classes include trees from four to 14.9 inches, fifteen to 31.9 inches, and 32 inches and greater. Using the size classes, tree density is calculated for an average number of trees per acre. The four to 14.9 inch size class has a density equivalent to 102 trees per acre within the community. There are 28 trees per acre in the fifteen to 31.9 inch size class, and roughly one tree greater than 32 inches for every two acres.

2. Pine Plantation

Background Information

The pine plantation community is adjacent to the southeastern portion of the dry mesic forest community. A pine plantation typically consists of a single species or a variety of species of pine trees planted in distinct rows with distinct spacing. Pine plantations are typically planted, maintained, and harvested for profit; however, the pine plantation community in the Northeast Neighborhood does not appear to be a venture based on compensation due to the relatively small acreage (approximately four acres).

Analysis

The analysis of the pine plantation community consisted of two sample plots near the center of the community. Two pine tree species, red pine and white pine, where found in the community roughly distributed equally.

All of the pine trees sampled fell into the first size class of between four and 14.9 inches in diameter at breast height. Seventeen trees were sampled and when calculated into density per acre there are 127 pine trees per acre.

3. Disturbed Mesic Forest

Background Information

The disturbed mesic forest is approximately two acres and is similar to a mesic forest based on the soil and growing conditions of a mesic forest. The distinguishing factor that alters a mesic forest to become a disturbed mesic forest is the lack of desirable tree species. These desirable trees, if ever present, have been harvested or died and undesirable trees have populated the community.

Analysis

There were only two species of trees identified in the disturbed mesic forest, box elder and silver maple. Both tree species are native, but are not considered to be desirable tree species because of weak growth structures, disease problems, and invasive tendencies. Of the trees found in the disturbed mesic forest community, only the silver maple tree, which has the dominant crown, is healthy. The box elder trees were noted to consist of stump sprouts and bent poor quality trees.

Of the thirteen trees sampled, all of the box elder trees had a diameter at breast height in the range of four to 14.9 inches and the silver maple tree measured 15.5 inches in diameter at breast height.

Heritage Trees

Heritage trees are estimated to be at least 200 years old. The City of Fitchburg is in the process of trying to identify locations of such trees within the City so that they can be preserved appropriately. White and bur oak trees are considered Heritage Oaks if the diameter at breast height is at least 38 inches. Pin, black, and red oak trees must have a dbh of 42 inches to be considered a Heritage Oak. Five Heritage Oaks meet these criteria in the study area. All five of the Heritage Oaks are located in the dry mesic forest community. In addition, a plains cottonwood tree and a silver maple tree with diameters greater than 50 inches have been identified as Heritage Trees.

Large, healthy oak trees that do not meet the Heritage Oak classification have also been identified as specimen trees. There are 23 large and healthy oak trees within the dry mesic forest community that are not classified as Heritage Oaks, but are considered worthy of being preserved and identified as specimen trees. These trees range from 27.5 inches to 38 inches in diameter at breast height. The locations of the Heritage and Specimen Trees are identified on Figure 4 of the attached woodlot inventory.

Herbaceous Plants and Woody Shrub Inventory

The understory of the woodlot offers a large expanse of area that is able to support a variety of herbaceous plants and woody shrubs. A preliminary review of the spring ephemeral vegetation was conducted in April and May, followed by further analysis in September to identify the species and surface cover of each species. The inventory area was determined by identifying four one-meter quadrants within each of the tree inventory sample plot radii. The shrubs and herbaceous plants were inventoried within each of the three woodland communities.

1. Dry Mesic Forest

   Of the understory within the dry mesic forest, more than 43 percent of the ground is bare and non-vegetated. More than four percent of the ground cover consisted of coarse woody debris. The most prominent herbaceous vegetation is non-native garlic mustard, covering more than 25 percent of the ground. Other notable native species include broad-leaf enchanter's-nightshade, wild geranium, and may-apple. Non-native species account for almost one-third of the total understory throughout the entire community. Some of the most prevalent species are garlic mustard, honeysuckle, and buckthorn

   The northwest portion of the woodlot is dominated by garlic mustard where it reaches an average percent cover of roughly 63 percent in specific sampling locations. It is noted that this is an area where the owner previously ran horses and the native plants were most likely eliminated as a result.

Along the northern portion of the community, the non-native and invasive shrubs make up approximately 64 percent of the cover in specific sampling locations. These shrubs include honeysuckle and buckthorn.

In the southern portion of the community, west of the pine plantation, the non-native, invasive shrub cover is minimal and the herbaceous understory vegetation is plentiful. This area of the community supports the highest density of native herbaceous vegetation including wild geranium, broad-leaf enchanter's-nightshade, and may-apple.

2. Pine Plantation

The understory of the pine plantation community is more than 56 percent bare ground and non-vegetated. Of the herbaceous vegetation, the non-native species only account for less than five percent of the total understory. The most dominant native species found in the pine plantation is the broad-leaf enchanter's-nightshade covering roughly 35 percent of the ground area.

3. Disturbed Mesic Forest

The disturbed mesic forest is known as a community where quality trees have been harvested or died and undesirable native trees populated the disturbed areas. The area covered by understory herbaceous plants is nearly divided evenly with roughly 28 percent of both native and non-native species. Almost 44 percent of the total ground area is non-vegetated or covered with coarse woody debris.

Slope and Soil Erosion Capability

Physically, future development is dependent upon the slope of the land and the ability of the soil to remain stable and resist erosion. Generally the majority of the study area slopes downward from southwest to northeast; however, the southeastern portions of the woodlot slope downward towards the southeast.

Based on the characteristics of the soil classes, the study area consists of slopes ranging from steep (12 to 20 percent slopes) to areas nearly level. The soils in the study area that are typically the steepest are found in the western portion of the woodlot. These steep areas transition into more gentle slopes, eventually leading to nearly flat lands in the northeast corner of the study area.

Coinciding with the slope characteristics of the soils are the soil erosion capabilities. The soils found on steep slopes are also known to be erosion hazards. Similar to the transition of slope characteristics, the soils in the western portion of the study area are highly susceptible to erosion, lessening in susceptibility as the slopes decline.

Soil Moisture and Nutrient Regime

The water capacity and fertility characteristics of the soils in the study area appear to be directly related to one another. Typically where water capacity is high the soils are very fertile, and where there is a moderate amount of water capacity the soils are moderately fertile. The only exception in the study area is in the Wacousta soils in the far northeast corner of the study area where the water capacity is high but the fertility is low. Other conditions that may affect these Wacousta soils are the land being nearly flat, the water table seasonally at the surface to less than a foot below the surface, and water permeating the soil at a moderately slow rate. Hydric soils and soils that may have hydric inclusions have been identified near the wetland in the dry mesic forest. The soils near the wetlands are also known to have a very shallow depth to groundwater. Seasonally the depth to groundwater is less than one foot from the surface. See Table 1 on the following page for more detail of the soil characteristics.

Table 1: Soil Characteristics

	Location	Typical Slope	Fertility	Water Capacity	Permeability	Depth to Water Table	Erosion	Primary Concerns
Dodge	South-central	6-12%	High	High	Moderate	More than 5 feet	Severe hazard	Erosion control, improvement of organic matter, cultivating surface layer, fertility
Kidder	Far west	12-20%	Medium	Medium	Moderate		Very severe hazard	Erosion control, improvement of organic matter, cultivating surface layer, fertility
McHenry	Western	12-20%, 6-12%	Medium	Medium	Moderate	More then 5 feet	Very severe hazard	Erosion control, conserving moisture, improvement of organic matter, cultivating surface layer, fertility
Military	Extreme south-central	6-12%	Medium	Medium or low	Moderate	More than 5 feet	Severe hazard	Root zone restricted due to soil depth, erosion control, water capacity
Sable	North-central	0-3%	High	High	Moderate	Less than 1 foot	None	Hydric soil
St. Charles	Central and north-central	0-15%	High	High	Moderate	Between 3 and 5 feet	Moderate	Erosion control
Troxel	Far north-central	1-4%	High	High	Moderately slow	Between 3 and 5 feet	Moderate	Gullying, flood control, erosion and maintenance of the organic matter content, cultivating surface layer
Virgil	North central	1-4%	High	High	Moderately slow	Above 1 to 3 feet	Moderate	Erosion control, moderate wetness
Wacousta	Far north-east	Level	Low	High	Moderately slow	1 foot or less	None	Hydric soil

Native Animal Species

Native animals are obviously not confined only to the boundaries of the study area. Therefore, testimonials and site observations were used to identify the animal species in the study area. These animal species include white-tailed deer, raccoon, gray squirrel, American robin, gray catbird wild turkey, common crow, blue jay, white-breasted nuthatch, and downy woodpecker.

Based on the unconfined nature of wildlife and the seasonal migrations that wildlife endure, the study area offers habitat typical for many other common animal species. A list of additional species that could inhabit the study area full-time or seasonally is included in Appendix A.

Threatened or Endangered Species

The State of Wisconsin Department of Natural Resources (DNR) Bureau of Endangered Resources completed a review of the Study Area and proximity with the Natural Heritage Inventory (NHI) to identify potentially endangered flora and fauna. Three endangered resources have been documented in the area including wetland communities identified as calcareous fen, shrub-carr, and southern sedge meadow. Based on the common species found in each of the three separate wetland communities and the inventory of understory species in the study area, it does not appear as though any of the three endangered wetland communities are located in the study area.

Historical records of rare species known to occur in the vicinity of the study area showed a possible existence of eleven rare plant species if appropriate habitat still exists. A comparison of the plant species database and the inventory of understory species in the study area shows that none of the rare plant species were identified in the study area. The DNR notes "the lack of additional known occurrences does not preclude the possibility that other endangered resources may be present." Also, "absences of an NHI occurrence in a specific area should not be used to infer absence of rare species." Therefore, simply because the rare and endangered species were not identified in the understory inventory does not definitively mean that there are not any rare or endangered species in the study area.

Ecological Habitat

The ecological habitat, or the interaction between vegetation and animals, is not unique to the study area. The woodlot within the Northeast Neighborhood offers a relatively large tract of moderate quality habitat; however, the study area in conjunction with the Nine Springs E-Way corridor to the north offers a plentiful and diverse habitat for wildlife.

Habitat diversity within the study area is deteriorating due to the encroachment of non-native species, which will affect the numbers of species the habitat can support. Future restoration and maintenance of the habitat will help with maintaining the diverse wildlife species currently living or visiting the study area.

The dry mesic forest community within the study area has a mature oak canopy with a moderate quality floristic community that is being intruded upon by non-native plant species. Great

restoration potential exists for the habitat, but it could prove challenging due to the invasive plant species and segmented land ownership. There are many landowners within or abutting the study area that could affect the overall quality of the habitat. The pine plantation and disturbed mesic forest communities have been categorized as having low quality floristic communities.

Any other Features or Resources

A wetland is located in the northeastern portion of the dry mesic forest community. The wetland boundaries were delineated by the Wisconsin Wetland Inventory (WWI) in addition to an analysis of the aerial photo by Natural Resources Consulting, Inc. The exact boundaries of the wetland are slightly different between the two studies; however, a perennial natural spring identified in the northern portion of the dry mesic forest community may contribute to the base flow of a perennial/intermittent waterway extending northeast into the wetland area.

Future Development

The purpose of the Specific Inventory and Resource Analysis is to determine the potential for future development within the woodlot located in the northern portion of the Northeast Neighborhood. Based on the natural resources data presented in this study, it appears that there are limited development opportunities in the woodlot; however, development opportunities are discussed for each community separately.

1. Dry Mesic Forest

   The dry mesic forest community consists of a mature overstory canopy with moderate floristic quality of the understory vegetation. Also found in the dry mesic forest community are soils that are characteristically steep with significant hazards related to erosion. This community is also subject to storm water flows, leading to flooding in the lower elevations thereby increasing the potential for erosion on the hillsides. Existing vegetation cover currently partially stabilizes the soil and buffers the effects of significant rain events. Future development in the dry mesic forest will also disturb this buffer and decrease soil stability.

   Installing streets and utilities through the dry mesic forest community will lead to major disturbances in the ecological habitat. Erosion issues would require increased engineering and structural components to create stabile roadways and utility connections, thereby increasing development costs and potentially causing a strain on Fitchburg's economic condition.

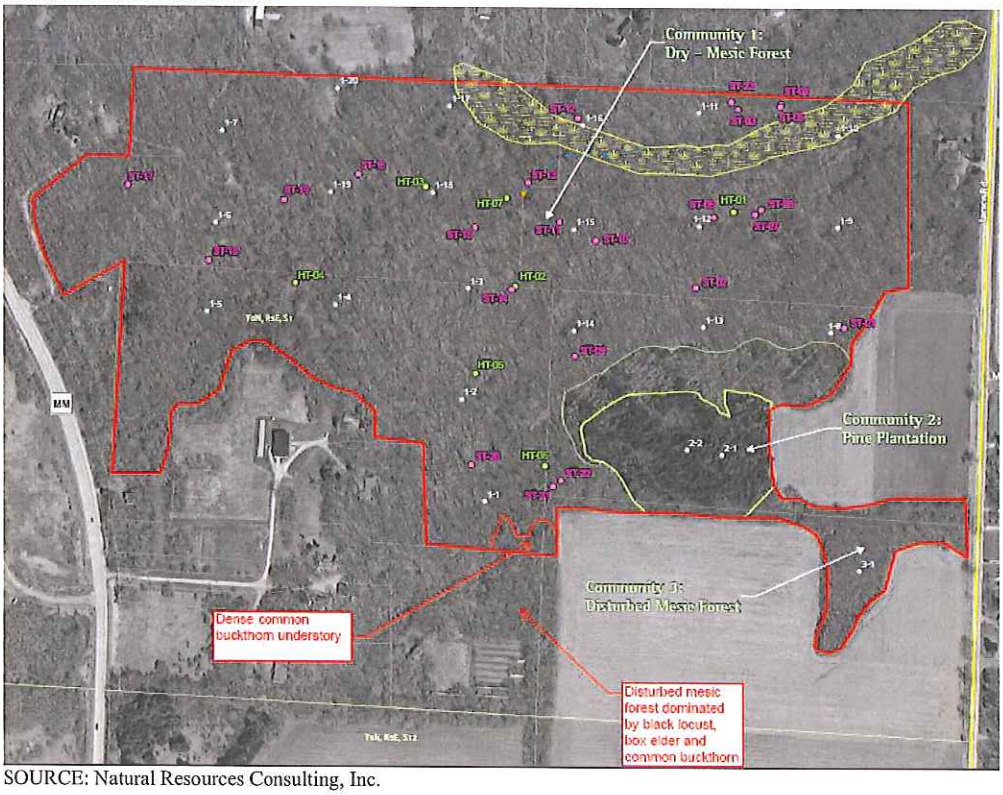
   The dry mesic forest community should remain natural area with an emphasis on restoring and maintaining the woodlot. Property owners throughout the dry mesic forest community should independently create a plan that focuses on restoring and maintaining the woodlot. It appears that the boundaries of the dry mesic forest may extend beyond the limits of the delineated community and the study area. While restoring and maintaining the dry mesic forest community, the characteristics of the dry mesic forest

community that extend from the study area should also be preserved and enhanced on the previously developed properties.

Future restoration projects to protect the dry mesic forest community could include passive recreational opportunities. The passive recreational opportunities could include trails, overlooks or vistas, signs or markers identifying the Heritage Trees, etc. Passive recreation will allow visitors to view the natural environment along with the wildlife within the woodlot.

Fieldwork for an addendum to the original site evaluation was completed on October 7, 2008 for the wooded area south of the Dry Mesic Forest near the center of the Northeast Neighborhood as shown on the following map. This area adjacent to the tilled agricultural fields is identified as a disturbed mesic forest dominated by black locust, box elder, and common buckthorn – all undesirable tree species and subcanopy. Future development and disturbance should be limited to the areas of disturbed mesic forest to preserve the dry mesic forest community to the greatest extent.

Addendum Evaluation



SOURCE: Natural Resources Consulting, Inc.

2. Pine Plantation

   The pine plantation community lacks the mature tree canopy and floristic quality found within the understory of the dry mesic forest. Based on the soil characteristics of the pine plantation community, the soils are relatively steep, but not quite as steep as the dry mesic forest. Erosion is a hazard that persists through the pine plantation community.

   Development in the pine plantation community is possible based on the low quality of the existing vegetation. Developing the pine plantation community would cause limited impacts to the floristic diversity. The soil characteristics may be more of a limiting factor for development. All future development in the pine plantation community will require extreme erosion controls.

3. Disturbed Mesic Forest

   The disturbed mesic forest community, similar to the pine plantation community, does not have the mature tree canopy or floristic understory quality of the dry mesic forest community. Soil characteristics indicate that there is a low to moderate hazard relating to erosion. A portion of the disturbed mesic forest community is located on a soil that has characteristics of a hydric soil.

   Future development in the disturbed mesic forest community would have limited impacts to the floristic diversity within the community. Development on the Sable Series of soils will require further site investigation to ensure the water content of the soil and the groundwater depth are suitable for development. All future development in the disturbed mesic forest community will require erosion control methods to eliminate disturbance to surrounding areas.

Conclusion

Development in the woodlot area would reduce the quality and quantity of habitat available for wildlife. Deer, turkey, and other species with a low tolerance for human activity will be inclined to move to other available habitat in the general area. Therefore, future development should be prohibited in the dry mesic forest community and efforts should be made to preserve the high quality tree canopy and diverse understory flora.

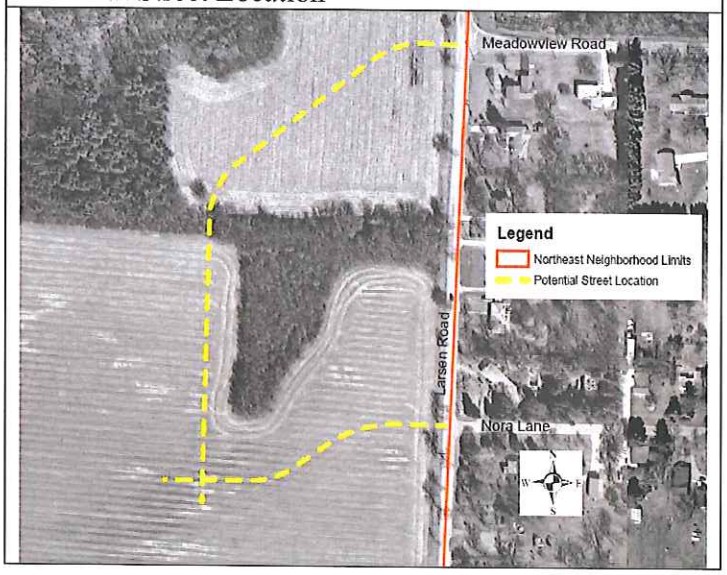
According to the DNR the Waubesa Wetlands, which is one of the highest quality and most diverse wetlands in southern Wisconsin, is located within two miles of the project site. A DNR representative noted, "Because the State Natural Area is not directly adjacent to your development project, I do not expect any impacts to the SNA as a result of project related disturbance."

Future development must include buffer areas to preserve the significant natural resources found within the Northeast Neighborhood including the wetlands, woodlot, and Heritage Trees. Creating buffers around the Heritage Trees is vital to the health of their root systems. Each

Heritage Tree should be evaluated by a licensed arborist, and preservation and buffering plans should be individually developed for each tree.

A street pattern accompanied by utilities would be needed with future development to allow for the transportation needs of the development. Based on the information provided and previously stated, there should not be any development in the dry mesic forest community; however, based on the lower quality tree canopy and understory vegetation in the other two woodland communities in the project area, a limited street network that intersects Meadowview Road and Nora Lane extending into the Northeast Neighborhood is feasible, so long as significant buffering of the dry mesic forest community is included as a component of the development. Due to the shape, size, and characteristics of the pine plantation and disturbed mesic forest communities, the road network could traverse these communities without causing major disturbances. From the southern edge of the pine plantation and disturbed mesic forest communities the road network could extend through the Northeast Neighborhood to County Trunk Highway MM, Goodland Park Road, and Larsen Road.

Potential Street Location



Overall, based on the natural resources inventory and analysis, development should be prohibited in the dry mesic forest community. Future development of the pine plantation and disturbed mesic forest communities should be limited to low impact residential development. The significant natural resources and habitat within the dry mesic forest community, including the mature tree canopy and understory vegetation, the natural spring, Heritage Trees, wetlands, and wildlife habitat should be preserved. Extending buffer areas from those resources, and including erosion and storm water controls, to development in adjacent areas are also necessary to prevent negative impacts from the development. The land adjacent to the woodlot must also be developed with low impact residential uses as a transition to more intensive land uses.

APPENDIX A

NRC
Natural Resources Consulting, Inc.

209 Commerce Parkway | PO Box 128 | Cottage Grove, Wisconsin 53527-0128
Ph: 608.839.1998 | Fax: 608.839.1995

www.nrcdifference.com

September 25, 2008

Mr. Steve Brunner
Ruekert Mileke
W233 N2080 Ridgeview Pkwy.
Waukesha, WI 53188

RE: Final Report - Northeast Neighborhood Resource Inventory and Analysis, NRC Project # 008-0022-01, City of Fitchburg, Dane County, Wisconsin

Dear Mr. Brunner,

Natural Resources Consulting, Inc. (NRC) is pleased to provide you with the final report for the Resource Inventory and Analysis for the large woodland tract located within the proposed Northeast Neighborhood (Figure 1). NRC has provided detailed information on the ecological resources present within the large woodlot located in the northern portion of the Northeast Neighborhood; hereby referred to as the "Project Area."

The Project Area is located in Section 1, Township 6 North, Range 9 East, in the City of Fitchburg, Dane County, Wisconsin (Figure 1). More specifically, the Project Area is located east of County Road MM, south of East Clayton Road and west of Larsen Road. The Project Area is part of the Southeast Glacial Plains Landscape which is made up of glacial till plains and moraines. The dominant land use within the Northeast Neighborhood planning area is agriculture; however the Project Area consists largely of a closed canopy hardwood forest with scattered residential development. Surface water drainage from the Project Area contributes to the Lake Monona-Yahara River watershed which is part of the Lower Rock River watershed.

This report details the methodology and results obtained from the tree and plant inventory and rare species survey; in addition to an environmental review of the soils, slope and erosion capability, wildlife use/ values, and any landforms present within the Project Area. A final summary is provided which analyzes the findings and the capabilities, and the implications of such analysis to the development and/ or preservation of the woodlot or sections of the woodlot.

METHODS

Monitoring events were completed during the months of April, May, and September 2008. An initial reconnaissance survey of the Project Area was performed to identify and map distinct community units. Community units were identified based on general uniformity in density, size distribution and species composition. Community unit boundaries were determined and mapped, and representative photographs for each plant community can be found in Attachment A. The mapped community unit boundaries were

digitized onto aerial photography using GIS technology and can be viewed on the attached Figure 4.

Sample plots were then established within each community unit where more species specific information such as percent cover and density of tree species could be determined. Methodology of plot placement was separated into two general categories, subjective and objective. The category used depended mainly on the size and integrity of each community unit. In areas where only one plot was needed, subjective plot placement was used. That is to say, the plot was placed at a carefully chosen site within the community unit so that the data collected from the plot represents the attributes of the community as a whole. The purpose of this methodology is to characterize the integrity of the community, which sometimes requires deliberately placing plots away from field edges, clearcuts, roadsides, or other anthropogenic disturbances. This was particularly important for Community 3 (Figure 4), where only one sample plot was used to describe the community. In the community units where more than one plot was selected, objective plot placement was used. Here the plots were placed at regular intervals along transects across the entire community. At each sample plot, tree, shrub and herbaceous inventories were conducted following the methodology outlined below.

Tree Inventory

The tree inventory was conducted during the April 2008 monitoring event. The size of each sample plot varied depending on the density of trees within the community. The ideal plot size was estimated by following the zigzag methodology, where the average distance between ten trees was used to determine the appropriate plot radius. Once the ideal plot size was established, it remained the same throughout the community. Twenty sample plots were established in Community 1 (Figure 4) with a radius of 26'4" or $1/20^{th}$ of an acre in size. Two sample plots were established in Community 2 with a radius of 16'8" or $1/15^{th}$ of an acre in size. One sample plots was established in Community 3 with a radius of 26'4" or $1/20^{th}$ of an acre in size. Within the sample plots all trees over 4" diameter at breast height (dbh) were recorded (4.5' feet above grade). Detailed information including the species, health, crown class, and dbh were recorded. Completed data sheets are presented in Appendix B. Data collected from the sample plots was used to determine the relative abundance of each species within the sample plots, average dbh, trees per plot and trees per acre.

In addition to recording all trees greater than 4 inches dbh within the sample plots, NRC identified, recorded and GPS recorded all potential Heritage Trees and larger Specimen Trees within each community. The City of Fitchburg's Parks, Recreation & Forestry Department has defined Heritage Oaks as containing a dbh of at least 38 inches (10-ft circumference) for white and bur oaks and at least 42 inches diameter (11-ft circumference) for pin, black, and red oaks. A meander survey technique was used to locate these trees. Figure 4 illustrates the locations of all Heritage and Specimen Trees and Attachment F provides a key to those trees.

Shrub & Herbaceous Inventory

The shrub and herbaceous inventory took place during the May and September, 2008 sampling event. An approximate percent cover of all shrub species located within the sample plots was recorded. Data collected from this inventory is presented on the Tree Data Sheets in Attachment B.

A quadrat sampling methodology and a meander survey were used to evaluate the herbaceous understory vegetation. The quadrat sampling methodology involved centering four equally positioned square meter quadrats around the sample plot center. Quadrats were placed along each cardinal direction (i.e. north,

south, east and west) approximately 10 feet from the plot center. The percent cover of each species was estimated using 5 % increments.

The average percent cover for each plant species identified was computed for each community, in addition to the average percentage cover for portions of the forested community where/ if noticeable trends existed. The relative frequency for each plant species identified was determined based on the number of quadrats in which the plant was identified.

A comprehensive species list was compiled for each community using a meander survey technique, where the investigator conducted surveys on a controlled intuitive or meander basis. This methodology ensured adequate coverage of the site variations present within each community. The meander surveys were conducted during the months of May and September 2008. A Floristic Quality Assessment was performed for each community using methodology developed by Floyd Swink and Gerald Wilhelm of the Morton Arboretum. This method is based on calculating an average Coefficient of Conservatism (C) and a Floristic Quality Index (FQI) for a site. A predetermined C value was assigned to each identifiable native plant species using locally appropriate values assigned by a panel of botanical expertise. Each native species is assigned a C value which ranges from 0 to 10 and represents an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition. C of 0 is applied to a species that demonstrates little fidelity to any remnant natural community; whereas C of 10 is applied to plants that are almost always restricted to pre-settlement remnants. Values lower than 4 generally representing weedy species and values closer to 10 representing more "conservative", rare or disturbance intolerant species.

FQI values were developed for each community within the Project Area using the formula:

FQI = Mean C($\sqrt{N}$)

C= Coefficient of Conservatism

N= species richness (Identifiable Native & Non-native)

FQI has traditionally been calculated using C values and species richness of only native species. However; more recently, scientists have been including the non-native species in the calculations, giving all non-native species a C value of "0". This is done because disregarding the non-native species can often give sites falsely elevated mean C and FQI values that do not reflect the presence or abundance of these less desirable species, which influence the overall floristic quality of an area. This methodology better reflects the actual integrity of a site, rather than simply using native species for the FQI analysis, particularly in highly disturbed conditions dominated by non-native taxa. The comprehensive species lists, with associated FQI calculations are presented in Attachment C.

Because it utilizes measures of floristic diversity and quality, the FQI can be used as one tool to evaluate the biological integrity and lack of disturbance in a particular site. FQI, however, should be used in conjunction with other tools (such as functional assessments, assessments of wildlife habitat, etc.) to evaluate the integrity, quality, and value of a site. While FQI results must be carefully interpreted, especially in small sites or stands, which usually result in lower FQI values regardless of species composition, it is generally accepted that an FQI of 35 and/or a mean C value of 4.0 indicates a site with very high floristic quality and integrity, while an FQI of less than 20 and a mean C value of less than 2.5 indicates that the site is degraded (Swink and Wilhelm 1994).

Rare Species

NRC requested a WDNR Natural Heritage Inventory (NHI) review for the Project Area in February, 2008. A response letter dated April 21, 2008 (Attachment D) provided specific information regarding the potential presence of specific rare species and potential impacts those resources. In response to this letter, NRC conducted a rare species survey for the rare plants listed within the NHI review following the methodology outlined below.

NRC conducted an initial desktop review, where specific habitat and ecosystem requirements, along with flowering periods, were collected for each of the species reported within the NHI review as occurring within 1-2 miles of the Project Area. For specific information regarding the species identified in the NHI review please refer to Attachment D. Flowering period and ecosystem requirements were determined in order to maximize the likelihood of detection. This is particularly important for species that are obscure when not in flower, but also aids in searching for more showy plants and can reduce the amount of time spent surveying.

Two field visits were used in order to cover the various blooming periods of the rare plant species. The spring survey event was conducted in May 2008 and the fall survey was conducted in September 2008. A systematic approach using a controlled, meander survey was used to ensure adequate coverage of the site variations present within each community. This approach is particularly suited for detecting rare and significant plant assemblages or community types within the survey area. In general, the methodology is designed to cover areas that appear likely to have rare plants, based on habitat and the judgment of the investigator. The methodology entails a thorough search of potentially suitable habitat based on a species known characteristics, historic records of species occurrences, and existing site conditions.

RESULTS

Three woodland community types were identified within the Project Area (Figure 4). Community 1 is a dry-mesic forest community that occupies the majority of the northern portion of the Project Area, extending from County Hwy MM in the west to Larsen Road in the east. Community 2 is a small red and white pine plantation located in the southeast portion of Community 1. Community 3 is a small disturbed mesic woodland located southeast of Community 2. Results obtained from the tree, shrub and herbaceous inventory, along with results from the rare species searches are presented separately for each community unit.

Community 1 – Dry-Mesic Forest

Community 1 is a Dry-Mesic forest community dominated by large canopy white, red and bur oak trees (*Quercus alba, Q. rubra*, and *Q. macrocarpa*) ranging in size from 3 to 50 inch diameter at breast height (dbh). This closed canopy community has a diverse sub-canopy layer comprised of the same oak species found in the canopy layer, in addition to shagbark hickory (*Carya cordiformis*), black cherry (*Prunus serotina*), black locust (*Robinia pseudoacacia*), hackberry (*Celtis occedentalis*), and quaking aspen (*Populus tremuloides*). Table 1 provides a summary of the tree density by size class within Community 1. Table 2 provides a summary of the relative abundance of trees and their respective mean dbh represented by each species. The location of each sample plot is identified on Figure 4.

Table 1. Community 1 Tree Density by Size Class

Dbh class (inches)	Average Trees/Plot	Average Trees/Acre
4.0 - 14.9	5.1	102
15.0 - 31.9	1.4	28
>32	0	0.45[1]

[1] Total derived from the meander survey rather than the tree survey. Approximately twenty-seven trees greater than 32 inches dbh were recorded in the 60 acre Community 1.

Table 2. Community 1 Tree Species Composition and Average Dbh

Species Name[2]	Common Name	Average Dbh	Relative Abundance[1]
Prunus serotina	wild black cherry	8.8	15%
Quercus alba	white oak	17.8	14%
Carya ovata	shagbark hickory	7.6	12%
Acer negundo	box elder	8.0	12%
ROBINIA PSEUDOACACIA	black locust	9.1	10%
Ulmus americana	American elm	8.5	7%
Carya cordiformis	pig-nut	6.0	6%
Quercus rubra	northern red oak	16.8	6%
Populus tremuloides	quaking aspen	11.2	5%
RHAMNUS CATHARTICA	common buckthorn	4.9	5%
Quercus macrocarpa	bur oak	17.6	2%
Ulmus rubra	slippery elm	9.6	2%
Celtis occidentalis	northern hackberry	9.3	2%
Populus grandidentata	large-toothed aspen	13.7	1%

[1] Calculated by averaging the total number of each species recorded in the sample plots. A total of 130 live trees were recorded in all 20 sample plots.
[2] All capital letters denotes a non-native species

Although the composition and distribution of the tree canopy and sub-canopy is fairly homogenous throughout this community; distinct variations exist within the shrub and herbaceous communities. Attachment E provides a table which illustrates the herbaceous layer quadrat data from Community 1. This table shows that the dominant herbaceous vegetation includes garlic mustard (*Alliaria petiolata*, 25% cover), broad-leaf enchanter's-nightshade (*Circaea lutetiana,* 8.4% cover), wild geranium (*Geranium maculatum*, 7.8% cover), and may-apple (*Podophyllum peltatum,* 3.9% cover), in addition to non-vegetated cover like bare ground and coarse woody debris with a total cover of approximately 48% cover.

Garlic mustard represents the largest percent cover of herbaceous vegetation; however its distribution is fairly cluster based on the observations made during the meander survey. Attachment H provides the raw quadrat data collected in the field with each species estimated percent cover. For example, garlic mustard reaches an average percent cover of approximately 63% at Sample Plots 1-4, 1-5, 1-6, 1-7, 1-20 and 1-19, while all other plots average together only contain approximately 9% cover. This example shows that garlic mustard is restricted mainly to the north-western portion of the Project Area.

Another example of trends within Community 1 includes the presence/ absence of non-native, invasive shrubs such as honeysuckle (*Lonicera X bella*) and buckthorn (*Rhamnus cathartica*). These species are most notable in the northern portion of Community 1 where they reach approximately 64% cover at Sample Plots 1-9, 1-10, 1-11, 1-16, and 1-17. The community average for all other plots is approximately 24% cover. When these shrub species reach this density the health (i.e., abundance and % cover) of the native understory herbaceous plants is often compromised. This can be quantified by averaging the percent cover of the herbaceous understory plants within only those quadrats at the sample plots mentioned above. Here the percent cover of non-vegetated bare ground reaches over 74% cover when compare to the community average of 43 % cover. In essence, the native understory herbaceous plants are unable to compete with the dense shade of the non-native shrub species.

In comparison, where non-native, invasive shrub cover is minimal the herbaceous understory vegetation is plentiful. This is evident in the south-central portions of the Project Area near Sample Plots 1-1 and 1-2 where non-native shrub cover is less than 10%. Here, the greatest density of native understory herbaceous plants is found. When the percent cover of herbaceous vegetation is averaged for only Sample Plots 1-1 and 1-2, approximately 63% cover of wild geranium (*Geranium maculatum*), 15% cover of garlic mustard, 9% cover of broad-leaf enchanter's nightshade and 7% cover of may-apple (*Podophyllum peltatum*) is observed.

The comprehensive species list with associated FQI data for Community 1 is presented in Attachment C. No rare species were found in this community. The FQI value when considering only native species is 24.9, while the FQI value for all species is 21.9. In addition, the mean C value for only native species is 3.5, while the mean C value for all species is 2.7. Based Swink and Wilhelm's range of FQI values and relative community quality these values generally indicate a moderate quality floristic community.

Community 2 – Pine Plantation

Community 2 is a small pine plantation dominated by 7-13 inch dbh white and red pine (*Pinus strobus* and *Pinus resinosa*). Overall the community has an open shrub layer except along the perimeter where deciduous shrub and tree species persist. In general, the herbaceous layer is minimal in areas heavily shaded by the overstory pine trees, as evident by the percentage of non-vegetated bare ground illustrated in Table 5 below. The average trees per acre within the pine plantation is approximately 127 trees and comprised of dbh between 4 and 15 inches (Table 3). The percentage of species is essentially evenly distributed between red and white pine (Table 4).

Table 3. Community 2 Tree Density by Size Class

Dbh class (inches)	Average Trees/Plot	Average Trees/Acre
4.0 - 14.9	8.5	127.5
15.0 - 31.9	0	0
>32	0	0

Table 4. Community 2 Species Percentage and Average Dbh

Species Name	Common Name	Average Dbh	Relative Abundance[1]
Pinus strobus	white pine	10.6	59%
Pinus resinosa	red pine	10.2	41%

[1] Calculated by averaging the total number of each species recorded in the sample plots. A total of 17 live trees were recorded in both sample plots.

Herbaceous data collected from the quadrats was summarized into percent cover for each species and relative frequency. The relative frequency for each plant species identified was determined based on the number of quadrats in which the plant was identified. The following table (Table 5) contains a listing of all species recorded in the quadrats and their associated frequency and average percent cover.

Table 5. Community 2 Quadrat Data Summary

Species Name	Common Name	Frequency	Average % Cover
Circaea lutetiana	broad-leaf enchanter's-nightshade	100%	35.0
Bare Ground/ Non-vegetated		100%	56.3
Carya ovata	shagbark hickory	50%	0.5
Rubus idaeus var. strigosus	American red raspberry	50%	2.8
RHAMNUS CATHARTICA	common buckthorn	38%	3.3
Ulmus americana	American elm	38%	0.4
Geum canadense	white avens	25%	0.3
SOLANUM DULCAMARA	bittersweet nightshade	25%	0.8
ARCTIUM MINUS	common burdock	13%	0.1
Arisaema triphyllum	Jack-in-the-pulpit	13%	0.1
Galium aparine	sticky-willy	13%	0.6
Prunus serotina	wild black cherry	13%	0.1
Quercus rubra	northern red oak	13%	0.1
Rubus allegheniensis	Allegheny blackberry	13%	0.6
TARAXACUM OFFICINALE	common dandelion	13%	0.1

A comprehensive species list for this community is shown in Attachment C. No rare species were found in this community. Native understory herbaceous plants represent approximately 40% cover while non-native understory herbaceous plants represent approximately 4% cover. The FQI value when considering only native species is 14.8, while the FQI value for all species is 12.6. In addition, the mean C value for only native species is 3.5, while the mean C value for all species is 2.5. Based on Swink and Wilhelm's range of FQI values and relative community quality these values generally indicate a low quality floristic community. In general, very high quality sites have FQI values near 35 and degraded sites have FQI values of less than 20.

Figure 4 illustrates a transition zone surrounding the northern portion of Community 2. This transition zone largely resembles Community 1 species composition and distribution; however there are scattered white and red pine intermixed. Since the overstory pine trees are not as dense as they are within Community 2 there is an understory assemblage more similar to Community 1.

Community 3

Community 3 is a disturbed mesic forest dominated by dense, poorly formed box elder (*Acer negundo*) trees ranging in size from 5-9 inches dbh (Tables 6 & 7). At the sample point shrub cover of honeysuckle is approximately 5%; however, the meander survey observed areas within this community to contained dense shrub cover of large honeysuckle shrubs. Non-vegetated, bare ground remains the highest cover with approximately 41 % cover, closely followed by buckthorn seedlings with an average percent cover of 23.8.

Table 6. Community 3 Tree Density by Size Class

Dbh class (inches)	Average Trees/Plot	Average Trees/Acre
4.0 - 14.9	12	240
15.0 - 31.9	1	20
>32	0	0

Table 7. Community 3 Species Percentage and Average Dbh

Species Name[2]	Common Name	Average Dbh	Relative Abundance[1]
Acer negundo	box elder	6.9	92%
Acer saccharinum	silver maple	15.5	8%

[1] Calculated by averaging the total number of each species recorded in the sample plots. A total of 13 live trees were recorded at the sample plot.

Herbaceous data collected from the quadrats was summarized into percent cover for each species and relative frequency. The relative frequency for each plant species identified was determined based on the number of quadrats in which the plant was identified. The following table (Table 8) contains a listing of all species recorded in the quadrats and their associated frequency and average percent cover. A comprehensive species list for this community is shown in Attachment C.

Table 8. Community 3 Quadrat Data Summary

Species Name	Common Name	Frequency	Average % Cover
Geum canadense	white avens	100%	5.0
RHAMNUS CATHARTICA	common buckthorn	100%	23.8
Viola sororia	door-yard violet	100%	17.5
Bare Ground/ Non-vegetated		100%	41.3
Acer rubrum	red maple	75%	0.8
Circaea lutetiana	broad-leaf enchanter's-nightshade	50%	5.0
ROSA MULTIFLORA	multiflora rose	50%	3.8
Ambrosia trifida	giant ragweed	25%	0.3
Carex rosea	stellate sedge	25%	2.5
Galium aparine	sticky-willy	25%	1.3
Quercus rubra	northern red oak	25%	0.3
TARAXACUM OFFICINALE	common dandelion	25%	0.3
Coarse Woody Debris		25%	2.5

No rare species were found in this community. Native understory herbaceous plants represent approximately 33% cover while non-native understory herbaceous plants represent approximately 28% cover. The FQI value when considering only native species is 16.2, while the FQI value for all species is 13.9. In addition, the mean C value for only native species is 3.0, while the mean C value for all species is 2.2, indicated a very low floristic quality site. Based Swink and Wilhelm's range of FQI values and relative community quality these values generally indicate a low quality floristic community.

ENVIRONMENTAL REVIEW

An initial desktop review of the environmental features present within the Project Area included research on soils, wildlife, wetlands and waterways. A discussion of each is presented below.

Soils

Using the available soil maps (Figure 2), NRC collected detailed information on the soils present within the Project Area. Characteristics associated with the individual soil map units including soil moisture, nutrient regime, slope and erosion capability were also evaluated. The following soil series descriptions are encountered within the Project Area.

The Dodge series consists of deep, well-drained, gently sloping and sloping soils on glaciated uplands. These soils formed under mixed hardwoods in 26 to 36 inches of loess over sandy loam glacial till. These soils have high fertility. The available water capacity is high, and permeability is moderate. The seasonal high water table is at a depth of more than 5 feet. The Dodge silt loam map unit with 6-12% slope (DnC2) is located in the south-central portion of the Project Area. The only limitation of this soil is a sever hazard of erosion. The primary concerns of management are control of erosion and improvement of the organic matter content, tilth of the surface layer, and fertility.

The Kidder series consists of deep, well-drained, gently sloping to very steep soils on glaciated uplands. These soils formed in glacial till under mixed hardwoods. The depth to calcareous glacial till is 24 to 40 inches. These soils have medium fertility. The available water capacity is medium, and permeability is moderate. The Kidder loam map unit with 12-20% slope is found in the western portion of the Project Area. This map unit is on lower side slopes. The hazard of erosion is very severe. The primary concerns of management are improving organic matter content, maintaining tilth, raising the level of fertility, and controlling erosion.

The McHenry soil series consist of deep, well-drained gently sloping to moderately steep soils on glacial uplands. These soils formed in thin loess and sandy loam glacial till under thin stands of mixed hardwoods. The loess is 10 to 15 inches thick over till that is 5 to 20 feet or more thick. The depth to calcareous till is 24 to 40 inches. These soils have a medium level of fertility. The available water capacity is medium, and permeability is moderate. The water table is at a depth of more than 5 feet. Two map units can be found in the Project Area. The McHenry silt loam with 12-20% slope (MdD2) occupies a large area in the western portion of the Project Area. This soil can be found on lower side slopes. This soil has a very severe hazard of erosion. The major concerns of management are improving organic matter content, conserving moisture, maintain tilth, increasing fertility, and controlling erosion. The McHenry silt loam with 6-12% slope (MdC2) can be found in the south-eastern portion of the site (associated with the pine plantation). This map unit is on nearly uniformly shaped middle side slopes. The limitations of this soil are a sever hazard of erosion and a medium available water capacity. The major concerns of management are controlling erosion, conserving moisture, improving the organic matter content and tilth of the surface layer, and increasing fertility.

The Military series consists of moderately deep, well-drained, sloping to steep soils on glaciated uplands. These soils are in areas of shallow glacial drift where sandstone bedrock is exposed. They formed in sandy loam glacial till and sandstone bedrock. The upper part of the soil formed in weathered glacial till about 28 inches thick. The lower part formed in residuum weathered from sandstone. These soils have medium fertility. The available water capacity is medium or low, and permeability is moderate. The root zone is slightly restricted because of the depth of these soils, which ranges from 20 to 40 inches. The water table is at a depth of more than 5 feet. The Military loam with 6-12% slope (MhC2) can be found only in the far southern portion of the Project Area. This map unit is on middle and lower side slopes on uplands. The major limitations to the use of this soil are a sever hazard of erosion and medium available water capacity.

The Sable series is a hydric soil and consists of deep, nearly level and gently sloping, poorly drained soils on low benches in stream valleys. These soils formed under sedges in deep silty material more than 4 feet thick. Neutral sandy outwash underlies the silt in most places. Sable soils have high fertility. The available water capacity is high, and permeability is moderate. The seasonal high water table is between the surface and a depth of 1 foot. The Sable silty clay loam with 0-3% slope can be found in the northeast portion of the Project Area.

The St. Charles series consist of deep, nearly level to moderately steep, well drained and moderately well drained soils on glaciated uplands. These soils formed in deep loess and loamy glacial till under mixed hardwoods. They formed in 40 to 60 inches of loess and in the underlying loamy outwash or sandy loam till. Slope commonly is 0 to 15 percent but ranges from 0 to 30 percent. These soils have high fertility. The available water capacity is high and permeability is moderate. The seasonal high water table is below a depth of 3 feet, and is usually is below a depth of 5 feet. Two map units can be found in the Project

Area. The St Charles silt loam with 2-6% slope (ScB) is found in a narrow portion of the south-east corner of the Project Area. This soil is characteristically found on ridgetops and upper side slopes. This map unit has moderate hazard of erosion. The St Charles silt loam with 6-12% slope (ScC2) occupies a large are in the central portion of the Project Area. This soil is characteristically found on nearly uniformly shaped middle side slopes. The major concerns for management are controlling erosion. (Both are woodland suitable)

The Troxel series contains possible hydric inclusions and consists of deep, gently sloping well drained and moderately well drained soils in draws, on fans, and in drainageways. They are below steeper, silty soils. Troxel soils have high fertility. The available water capacity is very high, and permeability is moderate. The soils are strongly acid to neutral. The water table is below a depth of 3 feet, and it is generally below a depth of 5 feet. Flooding is frequent. The Troxel silt loam with 1-4% slope can be found in the northwestern portion of the Project Area. This map unit is subject to frequent flooding of short duration. The hazard of erosion is moderate. Gullying is especially difficult to control. The main concerns of management are control of flooding and erosion and maintenance of the organic matter content and tilth of the surface layer. Grassed waterways or mechanical structures help to prevent gullying.

The Virgil series contains possible hydric inclusions and consists of deep, nearly level and gently sloping, somewhat poorly drained soils on low benches on uplands and in stream valleys. These soils formed in deep loess and glacial till or sand and gravel outwash under mixed hardwoods and an understory of grasses. These soils are high fertility. The available water capacity is high, and permeability is moderately slow. The seasonal high water table is above a depth of 1 to 3 feet in spring. The Virgil silt loam with 1-4% slope can be found in the north-central portion of the Project Area, adjacent to the Sable series. The limitations to use of this soil are a moderate hazard of erosion and moderate wetness. Protection from runoff from higher lying areas and removal of excess subsurface water help to control erosion and reduce wetness.

The Wacousta series is a hydric soil and consists of deep, nearly level, poorly drained soils on low benches in old lake basins. These soils formed under sedges in silt that has a few very thin layers if very fine sand. These soils have low fertility. Available water capacity is high, and permeability is moderately slow. The seasonal high water table is at a depth of 1 foot or less. Because these soils are alkaline throughout the profile, available phosphorus is deficient. The Wacousta silty clay loam (Wa) map unit is found only in the northeast corner of the Project Area.

Wetlands/Waterways

The Wisconsin Wetland Inventory (WWI) identifies one wetland (Figure 3) located within the northeast portion of the Project Area. NRC also aerially delineated a wetland in the same general area as the WWI data. Field investigations yielded a perennial spring located in the north-central portion of the Project Area (Figure 4) which contributes to the base flow of a perennial/ intermittent waterway extending north into the wetland area.

Wildlife Description

As part of the overall environmental review an effort was made to identify wildlife species that are likely to inhabit the Project Area. This evaluation was made by comparing the habitat present within the Project Area to the habitat requirements for species known to reside in or frequent this geographic range. Also, wildlife species observed while conducting the vegetation/tree inventory and other site visits, were

documented. Descriptions of the habitat are presented in the preceding sections of this document. Based on the primarily forested habitat present within the Project Area the list of species potentially present is somewhat limited to those species having an affinity to such habitat. Anecdotal observations of wildlife species and/or indications of their presence include: white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), gray squirrel (*Sciurus carolinensis*), American robin (*Turdus migratorius*), gray catbird (*Dumetella carolinensis*), wild turkey (*Meleagris gallopavo*), common crow, (*Corvus brachryhynochos*) blue jay (*Cyanocitta cristata*), white-breasted nuthatch (*Sitta carolinensis*), and downy woodpecker (*Picoides pubescens*). An in depth list of additional species that could potentially reside on or seasonally inhabit the Project Area can be found in Attachment G

SUMMARY

NRC has completed the resource inventory and analysis for the large woodland tract located within the northern portion of the proposed Northeast Neighborhood planning area. The following summary highlights the primary findings of this environmental assessment exercise and offers insight to the potential limitations of implementing development within the Project Area or portions of the area, and/or the challenges of restoring and managing the integrity of this natural community. Table 9 below provides a summary of the floristic quality for each community unit within the Project Area.

Table 9. Floristic Quality within the Northeast Neighborhood planning area

Community Unit	Native vs. All Species	Species Richness	Mean C Value	FQI
Community 1	Native	51	3.5	24.9
	All Species	66	2.7	21.9
Community 2	Native	18	3.5	14.8
	All Species	25	2.5	12.6
Community 3	Native	30	3.0	16.2
	All Species	41	2.2	13.9

As discussed in more detail above in the results section, Community 1 is considered moderate in floristic quality. However, unlike Communities 2 and 3, the age structure and spatial distribution of the dominant oak canopy suggests a forest which has persisted for at least 100 years. While the canopy tree species have remained unaltered for quite some time, the relatively recent invasions of non-native plant species like garlic mustard, buckthorn, and honeysuckle have significantly altered the native understory plant assemblages. As a result, there is great restoration potential for this community. However restoring the native understory plant assemblages could prove challenging given the nature of the invasive species in question and the challenges with various landowners.

The wildlife habitat and wildlife species composition within the Project Area is not unique to this geographic area. However, within this rapidly developing landscape, the Project Area provides a relatively large tract of moderate quality contiguous habitat. As a result, there is an abundance of white-tailed deer, wild turkey, squirrels and other species occupying this parcel. Deterioration of the existing habitat by encroachment of non-native species has, and will continue to reduce the habitat diversity and ultimately the numbers of each species this habitat can support. Restoration and maintenance of this woodland community would help to maintain, and potentially increase the diversity and number of wildlife species occupying the Project Area.

Development within Community 1 has the potential to impact the health of the mature overstory canopy. Communities 2 and 3 are likely much younger stands with significantly lower floristic quality. If development were to occur in these two areas, there would be limited impacts to the floristic diversity within these communities. Also, development would reduce the quality and quantity of habitat available for wildlife. This would cause certain species, such as deer and turkey that are less tolerant of human activity, to be displaced to other available habitat in the general area.

Further challenges to development relate to the topography and hydrology within the Project Area. For example, the southern and western portions of the Project Area exhibit severe to very severe hazards of erosion based on the available soil data and field observations. In addition, the northern portion of the Project Area is subject to frequent flooding and gullying if erosion in upland areas is not controlled. The current vegetation cover helps mediate this erosion potential by stabilizing the soil and buffering the effects of significant rain events. Long-term stormwater management and erosion control measures will be of great importance in any development scheme for this area.

LITERATURE CITED

Swink, F. and G. Wilhelm. 1994. *Plants of the Chicago Region*. 4th ed. Indiana Academy of Science, Indianapolis. 921 pp.

Sincerely,

Natural Resources Consulting, Inc.

William R. Poole

William Poole
Principal Scientist

Melissa Curran

Melissa Curran
Environmental Technician/Botanist

Enclosures:

Figures:
Figure 1: Project Location and Topography
Figure 2: NRCS Soil Survey Data
Figure 3: WI Wetlands Inventory Data
Figure 4: Field Data
Attachment A: Photographs
Attachment B: Tree Data Sheets
Attachment C: Species Lists
Attachment D: WDNR NHI Review Letter
Attachment E: Community 1 Herbaceous Layer Quadrat Data Summary
Attachment F: Heritage and Specimen Trees
Attachment G: Wildlife Species
Attachment H: Raw Quadrat Data

FIGURES

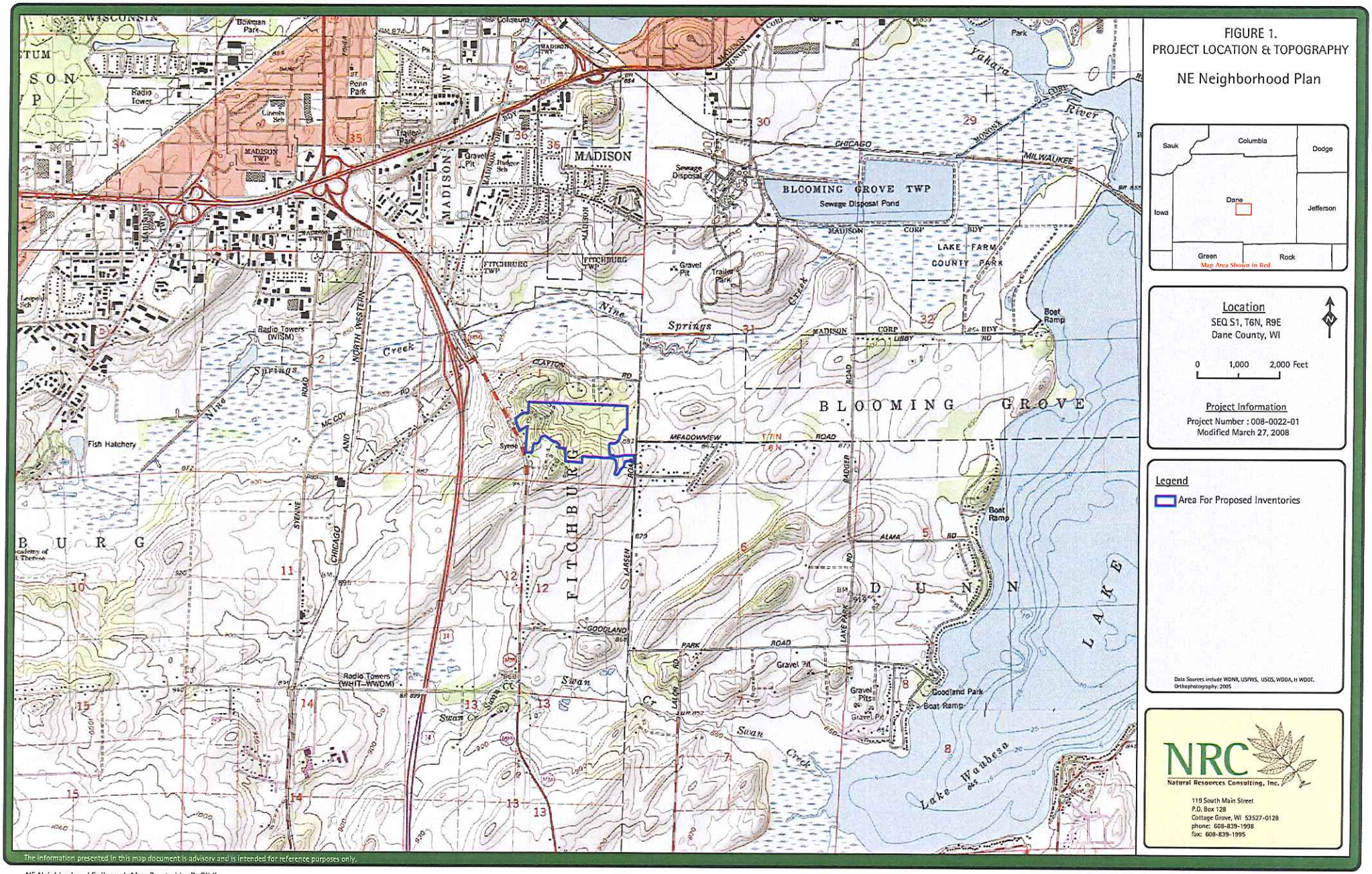


FIGURE 1.
PROJECT LOCATION & TOPOGRAPHY

NE Neighborhood Plan

Location
SEQ S1, T6N, R9E
Dane County, WI

0 1,000 2,000 Feet

Project Information
Project Number : 008-0022-01
Modified March 27, 2008

Legend
Area For Proposed Inventories

Data Sources include WDNR, USFWS, USGS, WDOA, & WDOT.
Orthophotography: 2005

NRC
Natural Resources Consulting, Inc.
119 South Main Street
P.O. Box 128
Cottage Grove, WI 53527-0128
phone: 608-839-1998
fax: 608-839-1995

NE Neighborhood Soils.mxd Map Created by D. Giblin

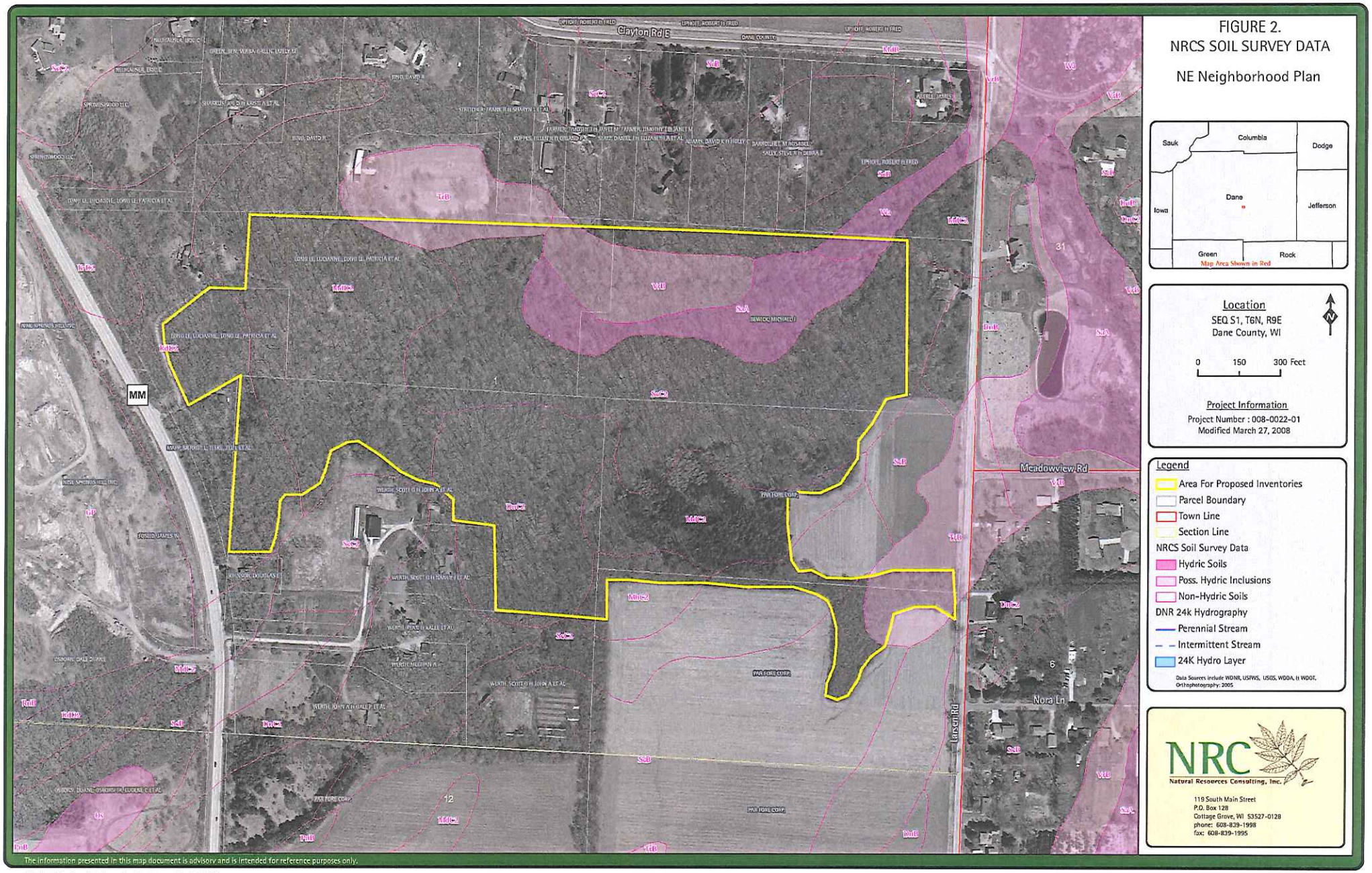


FIGURE 2.
NRCS SOIL SURVEY DATA

NE Neighborhood Plan

Location
SEQ S1, T6N, R9E
Dane County, WI

0 150 300 Feet

Project Information
Project Number : 008-0022-01
Modified March 27, 2008

Legend

- Area For Proposed Inventories
- Parcel Boundary
- Town Line
- Section Line

NRCS Soil Survey Data

- Hydric Soils
- Poss. Hydric Inclusions
- Non-Hydric Soils

DNR 24k Hydrography

- Perennial Stream
- Intermittent Stream
- 24K Hydro Layer

Data Sources include WDNR, USFWS, USGS, WDOA, & WDOT. Orthophotography: 2005

NRC
Natural Resources Consulting, Inc.
119 South Main Street
P.O. Box 128
Cottage Grove, WI 53527-0128
phone: 608-839-1998
fax: 608-839-1995

NE Neighborhood Soils.mxd Map Created by D. Giblin

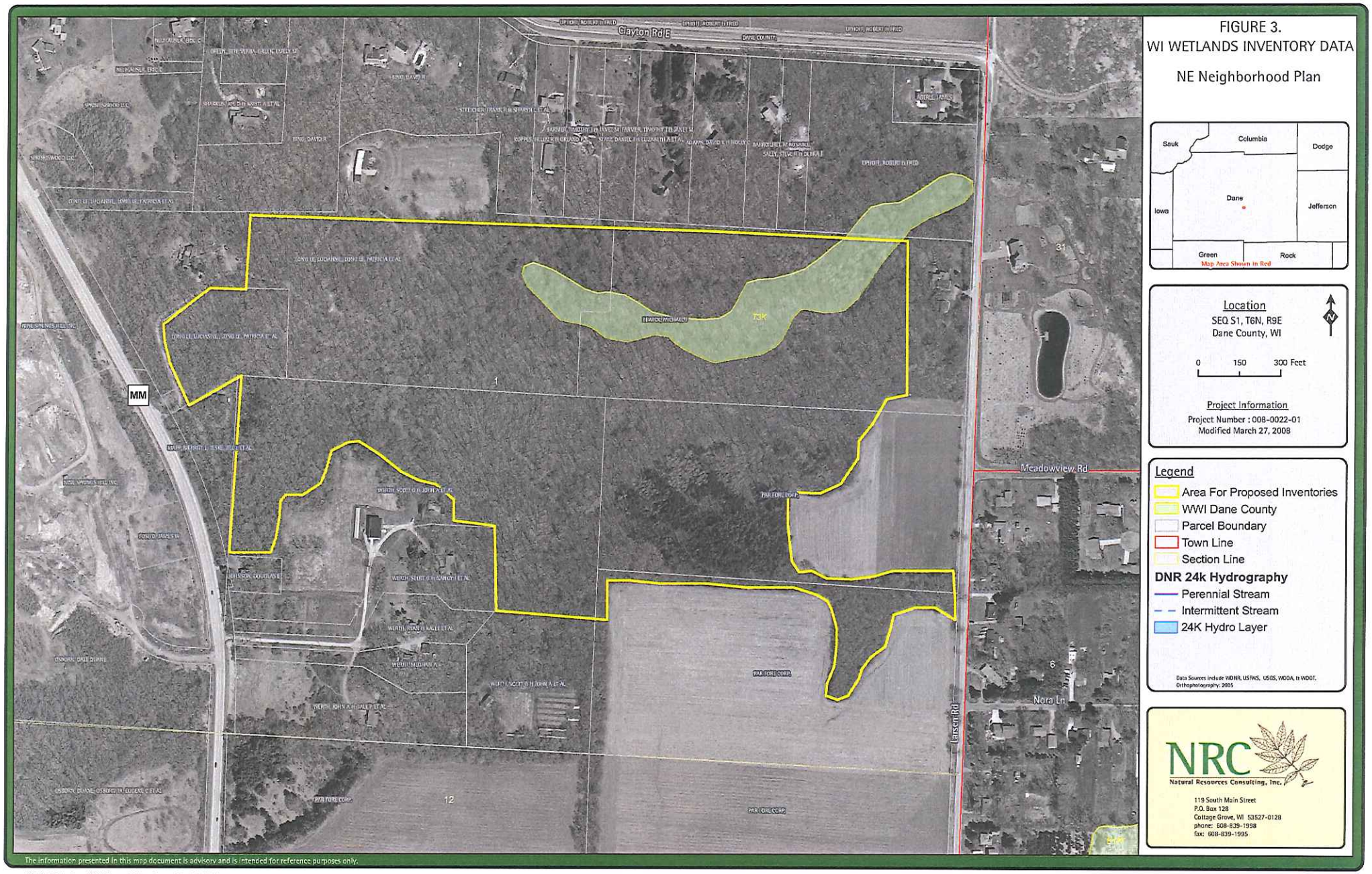


FIGURE 3.
WI WETLANDS INVENTORY DATA

NE Neighborhood Plan

Location
SEQ S1, T6N, R9E
Dane County, WI

0 150 300 Feet

Project Information
Project Number : 008-0022-01
Modified March 27, 2008

Legend
- Area For Proposed Inventories
- WWI Dane County
- Parcel Boundary
- Town Line
- Section Line

DNR 24k Hydrography
- Perennial Stream
- Intermittent Stream
- 24K Hydro Layer

Data Sources include WDNR, USFWS, USGS, WDOA, & WDOT.
Orthophotography: 2005

NRC
Natural Resources Consulting, Inc.
119 South Main Street
P.O. Box 128
Cottage Grove, WI 53527-0128
phone: 608-839-1998
fax: 608-839-1995

NE Neighborhood WWI.mxd Map Created by D. Giblin

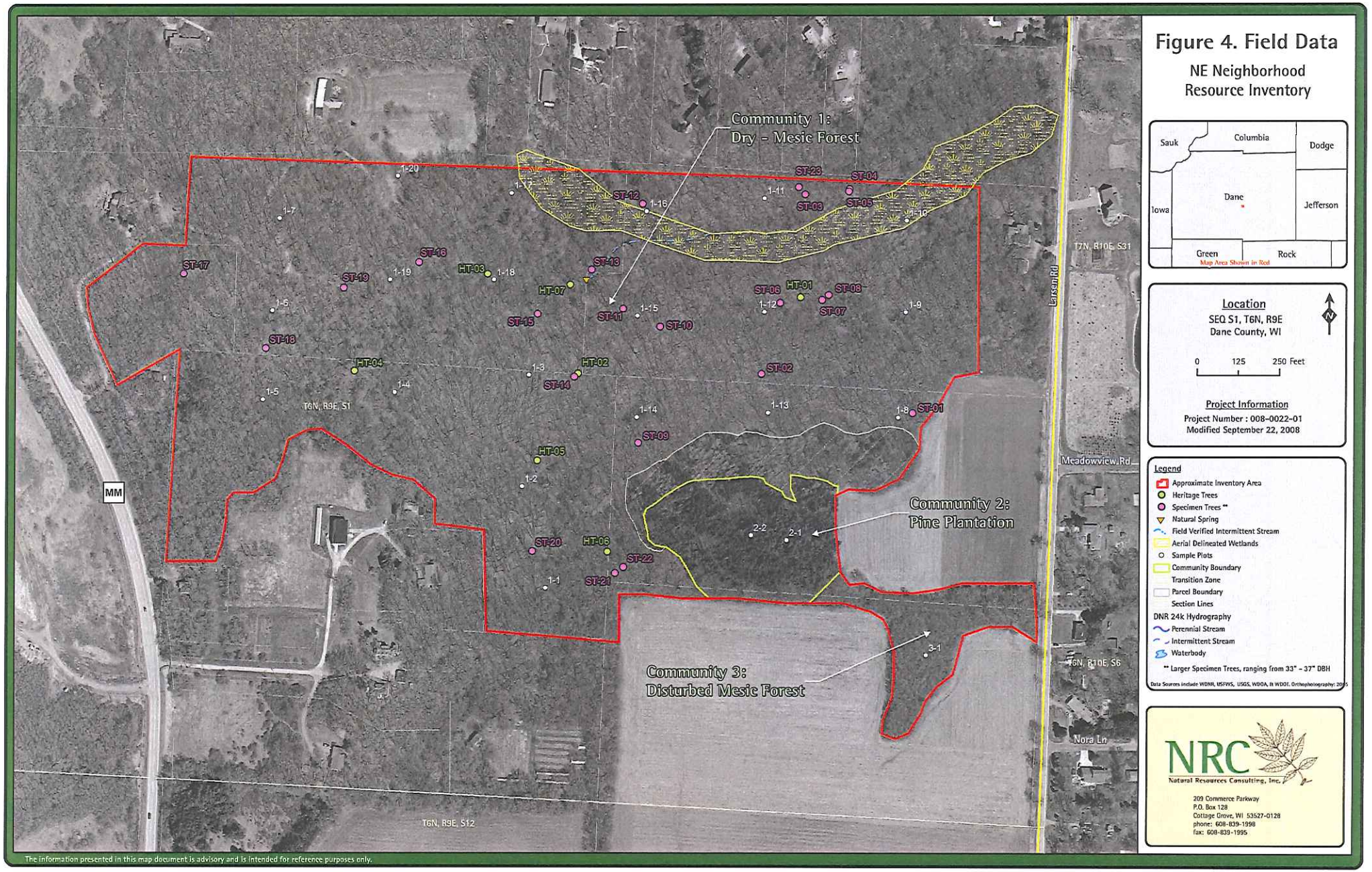


Figure 4. Field Data

NE Neighborhood Resource Inventory

Location
SEQ S1, T6N, R9E
Dane County, WI

0 125 250 Feet

Project Information
Project Number : 008-0022-01
Modified September 22, 2008

Legend

- Approximate Inventory Area
- Heritage Trees
- Specimen Trees **
- Natural Spring
- Field Verified Intermittent Stream
- Aerial Delineated Wetlands
- Sample Plots
- Community Boundary
- Transition Zone
- Parcel Boundary
- Section Lines

DNR 24k Hydrography

- Perennial Stream
- Intermittent Stream
- Waterbody

** Larger Specimen Trees, ranging from 33" - 37" DBH

Data Sources include WDNR, USFWS, USGS, WDOA, & WDOT. Orthophotography: 2005

NRC
Natural Resources Consulting, Inc.
209 Commerce Parkway
P.O. Box 128
Cottage Grove, WI 53527-0128
phone: 608-839-1998
fax: 608-839-1995

NE Neighborhood Plan Tree Inventory.mxd Map Created by M. Porzky

ATTACHMENT A

Photographs

Northeast Neighborhood
Community Photographs

Photo 1. Sample Point 1-1; illustrating dense native vegetation cover

Photo 2. Sample Plot 1-19; illustrating dense garlic mustard

Photo 3. Sample Plot 1-16 illustrating dense honeysuckle shrub cover

Photo 4. Community 2; Sample Plot 2-1

Photo 5. Community 3; Sample Plot 3-1

Photo 6. Community 3; illustrating dense honeysuckle shrub cover

ATTACHMENT B

Tree Data Sheets

Northeast Neighborhood Plan
Tree Inventory; NRC Project Number 008-0022-01
Date: 4/1/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-1**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Prunus serotina	black cherry	21.5	D	Healthy, some dead side limbs
2	Acer negundo	box elder	11.4	I	Lots of basal sprouts; leaning; no disease evident
3	Prunus serotina	black cherry	6.8	I	Few large cankers
4	Acer negundo	box elder	12	I	Very poor quality; lots of rot; dead limbs
Shrubs: Approximately 5-10% cover of buckthorn.					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory; NRC Project # 008-0022-01
Date: 4/1/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-2**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Prunus serotina	black cherry	9.6	I	Few cankers; otherwise healthy
2	Quercus alba	white oak	16.3	D	Healthy; some dead lower branches
3	Prunus serotina	black cherry	4.1	O	Some dead lower branches; some cankers
4	Quercus rubra	red oak	4.8	I	Healthy
5	Ulmus americana	American elm	4.6	I	Healthy
6	Prunus serotina	black cherry	6.2	I	Bent; lots of dead branches
7	Celtis occedentalis	hackberry	13	D	Healthy
8	Ulmus americana	American elm	5.7	I	Healthy
9	Carya ovata	shagbark hickory	4.3	O	Healthy
10	Prunus serotina	black cherry	5.5	O	Fallen over; poor quality
Shrubs: Approximately 5% cover of buckthorn in the shrub layer, but some seedlings present in the herbaceous layer.					
* One large buckthorn fallen, but likely still alive					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; ususally with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; ususally with small crowns considerably crowded on the sides ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory; NRC Project # 008-0022-01
Date: 4/1/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-3**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Quercus alba	white oak	18.6	CD	Lots of dead branches; stump sprout rotten
2	Quercus alba	white oak	20.2	D	Healthy; very few dead branches
3	Prunus serotina	black cherry	5.1	O	Very poor health; many dead branches; cankers
4	Quercus alba	white oak	19.7	D	Some fruiting bodies; some dead braches
5	Quercus alba	white oak	20.8	D	Some fruiting bodies; some dead braches
Shrubs: Approximately 10-15% cover of honeysuckle in the shrub layer. Tree regeneration includes: elm, black cherry and hickory.					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory; NRC Project # 008-0022-01
Date: 4/1/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-4**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Carya ovata	Shagbark hickory	6.2	O	Healthy
2	Acer negundo	box elder	9.4	O	Lots of knots
3	Robinia pseudoacacia	black locust	13.9	D	Some dead branches; bark falling off
4	Robinia pseudoacacia	black locust	21.8	D	Rot at base
5	Rhamnus cathartica	buckthorn	5.5	O	
6	Acer negundo	box elder	11.2	O	Bent; lots of side sprouts
7	Acer negundo	box elder	16.3	CD	Bent; lots of side sprouts
8	Acer negundo	box elder	7.5	O	Bent; lots of side sprouts
9	Ulmus rubra	red elm	15.2	D	Healthy
10	Robinia pseudoacacia	black locust	18.7	D	Healthy
Shrubs: Approximately 30-40% cover of buckthorn in the shrub layer.					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory; NRC Project # 008-0022-01
Date: 4/1/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-5**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Acer negundo	box elder	6.4	O	Severely bent; top on ground; lots of sprouts
2	Carya ovata	shagbark hickory	8.8	CD	Healthy
3	Carya ovata	shagbark hickory	5	O	Overtopped by another slightly larger hickory
4	Carya ovata	shagbark hickory	13.7	D	Healthy
5	Carya ovata	shagbark hickory	6	O	Healthy
6	Carya ovata	shagbark hickory	13.3	D	Basal sprout dead (9.8dbh); possible rot at base
7	Carya ovata	shagbark hickory	16.3	D	Healthy
8	Prunus serotina	black cherry	9	O	Poor quality
Shrubs: Approximately 15-20% cover of buckthorn in the shrub layer.					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory; NRC Project # 008-0022-01
Date: 4/1/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-6**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Rhamnus cathartica	buckthorn	4.5	O	
	Quercus alba	white oak	20.6	Dead	
2	Acer negundo	box elder	6.3	O	
3	Ulmus rubra	American elm	8.7	CD	Some dead branches
4	Acer negundo	box elder	9.6	CD	Bent; some dead branches
Shrubs: Approximately 60-70% cover of buckthorn in the shrub layer; one honeysuckle shrub noted					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory; NRC Project # 008-0022-01
Date: 4/1/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-7**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Quercus rubra	red oak	15.8	D	Some dead lower branches; healthy
2	Quercus rubra	red oak	17.5	D	Healthy
	Quercus alba	white oak	10.6	Dead	
3	Quercus rubra	red oak	26	D	Some dead branches with fungus; Healthy
4	Quercus alba	white oak	18.7	CD	Some rot at base; bent; some broken limbs
5	Ulmus rubra	red elm	5	O	Healthy
6	Ulmus americana	American elm	4.8	O	Healthy
7	Acer negundo	box elder	5	O	Poor form/quality
Shrubs: Approximately 5-10% cover of buckthorn in the shrub layer.					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighnorhood Plan
Tree Inventory; NRC Project # 008-0022-01
Date: 4/2/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-8**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Celtis occedentalis	hackberry	10.7	CD	Healthy
2	Quercus alba	red oak	13.8	D	Healthy
3	Celtis occedentalis	hackberry	4.3	O	Healthy
4	Carya ovata	shagbark hickory	10.1	CD	Healthy
5	Carya ovata	shagbark hickory	7.5	CD	Healthy

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory; NRC Project # 008-0022-01
Date: 4/2/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-9**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Prunus serotina	black cherry	4.5	I	Healthy
2	Quercus rubra	red oak	9.5	I	Broken top; side branches still alive; generally poor quality
3	Quercus alba	white oak	19.2	D	Healthy
4	Ulmus americana	American elm	14.1	CD	Healthy; forked at base with Tree # 5
5	Ulmus americana	American elm	11.8	CD	Healthy; forked at base with Tree # 4
6	Quercus macrocarpa	bur oak	10.9	I	Rot at base; leaning top; poor crown
7	Quercus alba	white oak	20.1	D	Healthy
Shrubs: Approximately 40% cover of non-native, invasive shrubs. These include half honeysuckle and half buckthorn.					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory; NRC Project # 008-0022-01
Date: 4/2/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-10**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Populus tremuloides	quaking aspen	12.3	D	Healthy
2	Populus tremuloides	quaking aspen	7.2	CD	Healthy
3	Populus tremuloides	quaking aspen	11.1	D	Healthy
4	Carya ovata	shagbark hickory	5.2	CD	Healthy
5	Carya ovata	shagbark hickory	4.1	I	Healthy
6	Carya ovata	shagbark hickory	4.3	I	Healthy
7	Populus tremuloides	quaking aspen	11.5	D	Fungus
8	Populus tremuloides	quaking aspen	12	D	Healthy
9	Populus tremuloides	quaking aspen	13.3	D	Healthy
10	Carya ovata	shagbark hickory	5.3	I	Healthy
11	Quercus rubra	red oak	4	I	Healthy
	Populus tremuloides	quaking aspen	10.1	Dead	Snag; standing dead; top broken
	Populus tremuloides	quaking aspen	12.1	Dead	Snag; standing dead; top broken
12	Populus tremuloides	quaking aspen	11	D	Healthy
13	Rhamnus cathartica	buckthorn	4	O	Healthy
Shrubs: Approximately 70-80% cover of 1-3 inch dbh buckthorn shrubs. Honeysuckle represents only a small percentage in the shrub layer, but is found frequently in the herbaceous layer.					

*Note: One inch of standing water at survey time; very low in topography; some higher hummocks without standing water

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Northeast Neighborhood Plan
Tree Inventory; NRC Project # 008-0022-01
Date: 4/2/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-12**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Quercus alba	white oak	23.2	D	Healthy
2	Quercus alba	white oak	18.3	CD	Healthy; some sweep to top; few dead top braches
3	Prunus serotina	black cherry	8.4	I	Healthy
4	Quercus alba	white oak	14.8	CD	Slight lean; some branches dead; otherwise healthy
5	Prunus serotina	black cherry	6	I	Healthy
Shrubs: Shrub cover is minimal with approximately 10-15% cover of honeysuckle and buckthorn.					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory: NRC Project # 008-0022-01
Date: 4/2/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-13**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Quercus alba	white oak	20	D	Healthy; few side branches dead
2	Quercus alba	white oak	19.9	D	Healthy
3	Acer negundo	box elder	5.8	I	Heavy lean; healthy
4	Carya cordiformis	yellow-bud hickory	4.1	I	Healthy
Shrubs: Approximately 15-20% cover of honeysuckle with some hickory regeneration in the shrub layer.					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neoghborhood Plan
Tree Inventory; NRC Project # 008-0022-01
Date: 4/2/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-14**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class**[1]	**Notes**
1	Carya cordiformis	yellow-bud hickory	4.8	o	Healthy
	Quercus macrocarpa	bur oak	19	Dead	Standing snag
2	Carya cordiformis	yellow-bud hickory	6	I	Healthy
Shrubs: Shrub cover is very dense with approximately 70-80% cover of mostly honeysuckle and a few buckthorn shrubs.					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory; NRC Project # 008-0022-01
Date: 4/2/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-16**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Rhamnus cathartica	buckthorn	5.6	O	
2	Ulmus americana	American elm	9.9	CD	Healthy
3	Quercus macrocarpa	bur oak	26.5	D	Healthy
4	Quercus alba	white oak	8.8	I	Healthy
Shrubs: Approximately 75-85% cover of honeysuckle and buckthorn. Each species contributes equally to the percent cover, and drastically shades out the understory vegetation.					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory; NRC Project # 008-0022-01
Date: 4/2/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-17**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Carya cordiformis	yellow-bud hickory	8.2	I	Top broken off; side sprouts still alive
2	Quercus alba	white oak	10.6	CD	Healthy
3	Prunus serotina	black cherry	8.6	CD	Large knot
Shrubs: Approximately 70-80% cover of honeysuckle. No tree regeneration noted.					
*Note: Two dead snags almost fallen over (~10dbh); probable oak species					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory; NRC Project # 008-0022-01
Date: 2/4/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-18**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Acer negundo	box elder	5.6	I	Some top braches dead; lots of side shoots
2	Ulmus americana	American elm	8.3	CD	Healthy
3	Ulmus americana	American elm	8.8	CD	Healthy
4	Ulmus americana	American elm	8.6	CD	Healthy
5	Prunus serotina	black cherry	4.9	O	Healthy
6	Carya cordiformis	yellow-bud hickory	5.8	O	Top branches broken; side shoots alive
7	Populus grandidentata	big-tooth aspen	13.7	CD	Healthy; possible rot at base
Shrubs: Approximately 15-20% cover of honeysuckle in the shrub layer. Tree regeneration includes: box elder.					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory; NRC Project # 008-0022-01
Date: 4/2/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-19**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Acer negundo	box elder	4.5	O	Poor quality and form
2	Quercus alba	red oak	18.2	D	Healthy; some dead side braches
3	Carya cordiformis	yellow-bud hickory	6.7	I	Top branches broken; side shoots alive
4	Acer negundo	box elder	4.5	O	Healthy; many side shoots
5	Prunus serotina	black cherry	19.4	D	Healthy
6	Carya cordiformis	yellow-bud hickory	4.8	I	Healthy
7	Acer negundo	box elder	6.5	I	Many side shoots
8	Carya cordiformis	yellow-bud hickory	7.6	I	Tree fallen and leaning on it
	Carya cordiformis	yellow-bud hickory	11.7	Dead	Standing snag
Shrubs: Approximately 10-15% cover of honeysuckle and buckthorn in the shrub layer.					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory; NRC Project # 008-0022-01
Date: 4/2/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 1-20**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Robinia pseudoacacia	black locust	7.2	CD/D	Healthy
2	Robinia pseudoacacia	black locust	4.3	CD/D	Healthy
3	Robinia pseudoacacia	black locust	4.8	CD/D	Healthy
4	Robinia pseudoacacia	black locust	4.2	CD/D	Healthy
5	Robinia pseudoacacia	black locust	5.6	CD/D	Healthy
6	Robinia pseudoacacia	black locust	6.9	CD/D	Healthy
7	Robinia pseudoacacia	black locust	6.2	CD/D	Healthy
8	Robinia pseudoacacia	black locust	4.8	CD/D	Healthy
9	Robinia pseudoacacia	black locust	7.4	CD/D	Healthy
10	Robinia pseudoacacia	black locust	11.9	CD/D	Healthy
Shrubs: Sample Plot is located in a open field recently invaded by black locust. As a result, no vegetation was present in the shrub layer.					
*Note: Marginal edge habitat dominated by black locust. Plot is situated between the edge of a large opening and smaller forest clearing					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory; NRC Project Number 008-0022-01
Date: 4/1/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 2-1**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Pinus resinosa	red pine	9.2	D	Healthy
2	Pinus strobus	white pine	10.4	D	Healthy
3	Pinus strobus	white pine	10.5	D	Healthy
4	Pinus strobus	white pine	7.5	CD	Healthy
5	Pinus strobus	white pine	11.2	D	Healthy
6	Pinus resinosa	red pine	10.3	D	Healthy
7	Pinus resinosa	red pine	11.6	D	Healthy
8	Pinus strobus	white pine	7	CD	Crooked; Possible pine weavel damage
9	Pinus strobus	white pine	12.9	D	Healthy

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory; NRC Project Number 008-0022-01
Date: 4/1/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 2-2**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Pinus resinosa	red pine	11.5	D	Healthy
2	Pinus resinosa	red pine	7.1	CD	Forked; healthy
3	Pinus resinosa	red pine	9.8	D	Healthy
4	Pinus resinosa	red pine	12.2	D	Healthy
5	Pinus strobus	white pine	12	D	Healthy
6	Pinus strobus	white pine	13	D	Healthy
	Pinus strobus	white pine	9.3	Dead	
7	Pinus strobus	white pine	13.9	D	Crooked; Possible pine weavel damage
	Pinus strobus	white pine	6.1	Dead	
8	Pinus strobus	white pine	8.4	CD	Healthy

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

Northeast Neighborhood Plan
Tree Inventory; NRC Project Number 008-0022-01
Date: 4/1/08

Investigators: Melissa Curran & Dave Giblin					**Forest Type and Plot Number: 3-1**
Tree #	**Common Name**	**Species**	**Dbh**	**Crown Class[1]**	**Notes**
1	Acer saccharinum	silver maple	15.5	D	Healthy
2	Acer negundo	box elder	7.6	CD	Bent; poor growth form
3	Acer negundo	box elder	6.7	O	All stump sprouts; poor quality; bent, rotten, dead branches on many
4	Acer negundo	box elder	8.3	CD	
5	Acer negundo	box elder	8.2	CD	
6	Acer negundo	box elder	7.9	CD	
7	Acer negundo	box elder	5.3	CD	Bent; poor growth form
8	Acer negundo	box elder	5.9	CD	Bent; poor growth form
9	Acer negundo	box elder	5.7	CD	Bent; poor growth form
10	Acer negundo	box elder	5.5	CD	Bent; poor growth form
11	Acer negundo	box elder	7.1	CD	Stump sprout; poor quality
12	Acer negundo	box elder	6.8	CD	
13	Acer negundo	box elder	8	CD	Large canker; poor quality
Shrubs: Approximately 5% cover of honeysuckle shrubs					
*Note: One dead box elder (~4 dbh)					

[1] ***Dominant (D):*** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. ***Codominant (CD):*** Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. ***Intermediate (I):*** Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. ***Overtopped (O):*** Trees with crowns entirely below the general level of the crown cover; receiving no direct light wither from above or from the sides.

ATTACHMENT C

Species Lists

Northeast Neighborhood Plan
Community 1: Dry-Mesic Forest

Scientific Name[1]	Common Name	Coefficient of Conservatism[2]	Physiognomy	Region 3 Wetland Coefficient
Acer negundo	box elder	0	Tree	FACW-
Acer rubrum	red maple	3	Tree	FAC
Agrimonia gryposepala	common agrimony	2	Forb	FACU+
ALLIARIA PETIOLATA	garlic mustard		Forb	FAC
Ambrosia trifida	giant ragweed	0	Forb	FAC+
Amphicarpaea bracteata	American hog-peanut	5	Herb. Vine	FAC
ARCTIUM MINUS	common burdock		Forb	UPL
Arisaema triphyllum	Jack-in-the-pulpit	5	Forb	FACW-
Athyrium filix-femina	common lady fern	5	Fern	FAC
BARBAREA VULGARIS	winter-cress		Forb	FAC
BERBERIS THUNBERGII	Japanese barberry		Shrub	FACU-
Cardamine concatenata	cut-leaved toothwort	6	Forb	FACU
Carex blanda	wood sedge	3	Sedge	FAC
Carex rosea	stellate sedge	4	Sedge	
Carya cordiformis	pig-nut	6	Tree	FAC
Carya ovata	shagbark hickory	5	Tree	FACU
Celtis occidentalis	northern hackberry	4	Tree	FAC-
Circaea lutetiana	broad-leaf enchanter's-nightshade	2	Forb	FACU
Crataegus spp	hawthorn		Shrub	
Cryptotaenia canadensis	Canadian honewort	4	Forb	FAC
Fragaria vesca	hillside strawberry	3	Forb	
Galium aparine	sticky-willy	2	Forb	FACU
Geranium maculatum	wild geranium	4	Forb	FACU
Geum aleppicum	yellow avens	3	Forb	FAC+
Geum canadense	white avens	2	Forb	FAC
Geum laciniatum	rough avens	5	Forb	FACW
GLECHOMA HEDERACEA	creeping-Charlie		Forb	FACU
Glyceria striata	owl meadow grass	4	Grass	OBL
Hackelia virginiana	beggar's-lice	3	Forb	FAC-
HESPERIS MATRONALIS	dame's rocket		Forb	[UPL]
Impatiens capensis	orange jewelweed	2	Forb	FACW
Leersia oryzoides	rice cut grass	3	Grass	OBL
LEONURUS CARDIACA	motherwort		Forb	[UPL]
LONICERA X BELLA	Bell's honeysuckle		Shrub	[FACU]
Malus ioensis var. ioensis	Iowa crab	4	Tree/Shrub	
MORUS ALBA	white mulberry		Tree	FAC
Onoclea sensibilis	sensitive fern	5	Fern	FACW
Oxalis stricta	common yellow oxalis	0	Forb	FACU
Parthenocissus quinquefolia	Virginia creeper	5	Woody Vine	FAC-
PHALARIS ARUNDINACEA	reed canary grass		Grass	FACW+
Phryma leptostachya	American lop-seed	5	Forb	UPL*
Phytolacca americana	American pokeberry	1	Forb	FAC-
Pilea pumila	Canadian clearweed	3	Forb	FACW
Podophyllum peltatum	may-apple	4	Forb	FACU
Polygonum sagittatum	arrow-leaved tear-thumb	6	Forb	OBL
Polygonum virginianum	jumpseed	7	Forb	FAC
Populus deltoides	plains cottonwood	2	Tree	FAC+
Populus grandidentata	large-toothed aspen	3	Tree	FACU
Populus tremuloides	quaking aspen	2	Tree	FAC
Prunus serotina	wild black cherry	3	Tree	FACU
Quercus alba	white oak	7	Tree	FACU

Northeast Neighborhood Plan
Community 1: Dry-Mesic Forest

Scientific Name[1]	Common Name	Coefficient of Conservatism[2]	Physiognomy	Region 3 Wetland Coefficient
Quercus macrocarpa	bur oak	5	Tree	FAC-
Quercus rubra	northern red oak	5	Tree	FACU
Ranunculus abortivus	little-leaf buttercup	1	Forb	FACW-
RHAMNUS CATHARTICA	common buckthorn		Tree	FAC-
Ribes cynosbati	dogberry	3	Shrub	[UPL]
ROBINIA PSEUDOACACIA	black locust		Tree	FACU-
ROSA MULTIFLORA	multiflora rose		Shrub	FACU
Rubus idaeus var. strigosus	American red raspberry	3	Shrub	FACW-
TARAXACUM OFFICINALE	common dandelion		Forb	FACU
Trillium grandiflorum	big white trillium	6	Forb	[UPL]
Ulmus americana	American elm	3	Tree	FACW-
Ulmus rubra	slippery elm	4	Tree	FAC
Urtica dioica	stinging nettle	1	Forb	FAC+
Viola sororia	door-yard violet	3	Forb	FAC-
Vitis riparia	river bank grape	2	Woody Vine	FACW-

[1]All capital letters denotes a non-native species

[2]Each native species is assigned a coefficient of conservatism (C) following the methods described by Swink and Wilhelm (1994) and Wilhelm and Masters (1995). Coefficients of conservatism range from 0 to 10 and represent an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition. For example, a C of 0, is given to plants that have demonstrated little fidelity to any remnant natural community, i.e. may be found almost anywhere. Similarly, a C of 10 is applied to plants that are almost always restricted to a pre-settlement remnant, i.e. a high quality natural area. Introduced plants were not part of the pre-settlement flora, so no C value is applied to these.

FQI Calculations

	Species Richness	Mean C Value	FQI
Native	51	3.5	24.9
All Species	66	2.7	21.9

Northeast Neighborhood Plan
Community 2: Pine Plantation

Scientific Name[1]	Common Name	Coefficient of Conservatism[2]	Physiognomy	Region 3 Wetland Coefficient
Acer negundo	box elder	0	Tree	FACW-
ALLIARIA PETIOLATA	garlic mustard		Forb	FAC
ARCTIUM MINUS	common burdock		Forb	UPL
Arisaema triphyllum	Jack-in-the-pulpit	5	Forb	FACW-
Asclepias exaltata	tall milkweed	7	Forb	NI
Carya ovata	shagbark hickory	5	Tree	FACU
Circaea lutetiana	broad-leaf enchanter's-nightshade	2	Forb	FACU
Geum aleppicum	yellow avens	3	Forb	FAC+
LEONURUS CARDIACA	motherwort		Forb	[UPL]
LONICERA X BELLA	Bell's honeysuckle		Shrub	[FACU]
Oxalis stricta	common yellow oxalis	0	Forb	FACU
Parthenocissus quinquefolia	Virginia creeper	5	Woody Vine	FAC-
Parthenocissus quinquefolia	Virginia creeper	5	Woody Vine	FAC-
Pinus resinosa	red pine	7	Tree	FACU
Pinus strobus	eastern white pine	5	Tree	FACU
Prunus serotina	wild black cherry	3	Tree	FACU
Quercus rubra	northern red oak	5	Tree	FACU
RHAMNUS CATHARTICA	common buckthorn		Tree	FAC-
Rubus allegheniensis	Allegheny blackberry	2	Shrub	FACU+
Rubus idaeus var. strigosus	American red raspberry	3	Shrub	FACW-
Rubus occidentalis	black raspberry	2	Shrub	[UPL]
SOLANUM DULCAMARA	bittersweet nightshade		Woody Vine	FAC
TARAXACUM OFFICINALE	common dandelion		Forb	FACU
Ulmus americana	American elm	3	Tree	FACW-
Urtica dioica	stinging nettle	1	Forb	FAC+

[1]All capital letters denotes a non-native species

[2]Each native species is assigned a coefficient of conservatism (C) following the methods described by Swink and Wilhelm (1994) and Wilhelm and Masters (1995). Coefficients of conservatism range from 0 to 10 and represent an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition. For example, a C of 0, is given to plants that have demonstrated little fidelity to any remnant natural community, i.e. may be found almost anywhere. Similarly, a C of 10 is applied to plants that are almost always restricted to a pre-settlement remnant, i.e. a high quality natural area. Introduced plants were not part of the pre-settlement flora, so no C value is applied to these.

FQI Calculations

	Species Richness	Mean C Value	FQI
Native	18	3.5	14.8
All Species	25	2.5	12.6

Northeast Neighborhood Plan
Community 3: Disturbed Mesic Forest

Scientific Name[1]	Common Name	Coefficient of Conservatism[2]	Physiognomy	Region 3 Wetland Coefficient
Acer negundo	box elder	0	Tree	FACW-
Acer rubrum	red maple	3	Tree	FAC
Acer saccharinum	silver maple	2	Tree	FACW
Acer saccharum	sugar maple	5	Tree	FACU
ALLIARIA PETIOLATA	garlic mustard		Forb	FAC
Ambrosia trifida	giant ragweed	0	Forb	FAC+
ARCTIUM MINUS	common burdock		Forb	UPL
BARBAREA VULGARIS	winter-cress		Forb	FAC
Bidens cernuus	nodding beggar-ticks	4	Forb	OBL
Carex blanda	wood sedge	3	Sedge	FAC
Carex rosea	stellate sedge	4	Sedge	
Carya ovata	shagbark hickory	5	Tree	FACU
Celtis occidentalis	northern hackberry	4	Tree	FAC-
Circaea lutetiana	broad-leaf enchanter's-nightshade	2	Forb	FACU
Cryptotaenia canadensis	Canadian honewort	4	Forb	FAC
Eupatorium rugosum	white snakeroot	1	Forb	FACU
Galium aparine	sticky-willy	2	Forb	FACU
Geum canadense	white avens	2	Forb	FAC
GLECHOMA HEDERACEA	creeping-Charlie		Forb	FACU
Hackelia virginiana	beggar's-lice	3	Forb	FAC-
HESPERIS MATRONALIS	dame's rocket		Forb	[UPL]
Impatiens capensis	orange jewelweed	2	Forb	FACW
LONICERA X BELLA	Bell's honeysuckle		Shrub	[FACU]
MORUS ALBA	white mulberry		Tree	FAC
Parthenocissus quinquefolia	Virginia creeper	5	Woody Vine	FAC-
Polygonum virginianum	jumpseed	7	Forb	FAC
Prunus serotina	wild black cherry	3	Tree	FACU
Quercus macrocarpa	bur oak	5	Tree	FAC-
Quercus rubra	northern red oak	5	Tree	FACU
Ranunculus abortivus	little-leaf buttercup	1	Forb	FACW-
RHAMNUS CATHARTICA	common buckthorn		Tree	FAC-
Ribes cynosbati	dogberry	3	Shrub	[UPL]
ROSA MULTIFLORA	multiflora rose		Shrub	FACU
Rubus occidentalis	black raspberry	2	Shrub	[UPL]
SOLANUM DULCAMARA	bittersweet nightshade		Woody Vine	FAC
TARAXACUM OFFICINALE	common dandelion		Forb	FACU
Ulmus americana	American elm	3	Tree	FACW-
Urtica dioica	stinging nettle	1	Forb	FAC+
Viola sororia	door-yard violet	3	Forb	FAC-
Vitis riparia	river bank grape	2	Woody Vine	FACW-
Zanthoxylum americanum	common prickly-ash	3	Shrub	UPL

[1]All capital letters denotes a non-native species

[2]Each native species is assigned a coefficient of conservatism (C) following the methods described by Swink and Wilhelm (1994) and Wilhelm and Masters (1995). Coefficients of conservatism range from 0 to 10 and represent an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition. For example, a C of 0, is given to plants that have demonstrated little fidelity to any remnant natural community, i.e. may be found almost anywhere. Similarly, a C of 10 is applied to plants that are almost always restricted to a pre-settlement remnant, i.e. a high quality natural area. Introduced plants were not part of the pre-settlement flora, so no C value is applied to these.

FQI Calculations

	Species Richness	Mean C Value	FQI
Native	30	3.0	16.2
All Species	41	2.2	13.9

ATTACHMENT D

WDNR NHI Review Letter

WISCONSIN
DEPT. OF NATURAL RESOURCES

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Matthew J. Frank, Secretary

101 S. Webster St.
Box 7921
Madison, Wisconsin 53707-7921
Telephone 608-266-2621
FAX 608-267-3579
TTY 608-267-6897

April 21, 2008

Josh Kapfer
Natural Resource Consulting
119 S. Main Street
Cottage Grove, WI 53527

SUBJECT: Endangered Resources Review (ERIR Log # 08-050)
Proposed "Northeast Neighborhood Resource Inventory" City of Fitchburg

Dear Mr. Kapfer,

The Bureau of Endangered Resources has reviewed the project area described in your review request received February 27, 2008 for the proposed "Northeast Neighborhood Resource Inventory" City of Fitchburg.

Our Natural Heritage Inventory (NHI) data files contain the following information for the project site located in T6N R9E Sections 1 & 12 in Dane County, Wisconsin. In addition to the proposed project site, endangered resource information is provided for an area within one mile of the project's location (and two miles for aquatic species). This information is provided so impacts to nearby endangered resources can be assessed and to assist in determining which rare species may occur in the project's impact area. If the described habitat types exist in the project's impact area, then species that occur nearby may be present at the proposed location. Endangered resources documented within and around the project area include:

- **Calcareous Fen** - An open wetland found in southern Wisconsin, often underlain by a calcareous substrate, through which carbonate-rich groundwater percolates. The flora is typically diverse, with many calciphiles. Common species are several sedges (*Carex sterilis* and *C. lanuginosa*), marsh fern (*Thelypteris palustris*), shrubby cinquefoil (*Potentilla fruticosa*), shrubby St. John's-wort (*Hypericum kalmianum*), Ohio goldenrod (*Solidago ohioensis*), grass-of-parnassus (*Parnassia glauca*), twig-rush (*Cladium mariscoides*), brook lobelia (*Lobelia kalmii*), boneset (*Eupatorium perfoliatum*), swamp thistle (*Cirsium muticum*), and asters (*Aster* spp.). Some fens have significant prairie or sedge meadow components, and intergrade with those communities.

- **Shrub-carr** - This wetland community is dominated by tall shrubs such as red-osier dogwood (*Cornus stolonifera*), meadow-sweet (*Spiraea alba*), and various willows (*Salix discolor, S. bebbiana,* and *S. gracilis*). Canada bluejoint grass (*Calamagrostis canadensis*) is often very common. Associates are similar to those found in Alder Thickets and tussock-type Sedge Meadows. This type is common and widespread in southern Wisconsin but also occurs in the north.

- **Southern Sedge Meadow** - Widespread in southern Wisconsin, this open wetland community is most typically dominated by tussock sedge (*Carex stricta*) and Canada bluejoint grass (*Calamagrostis canadensis*). Common associates are water-horehound (*Lycopus uniflorus*), panicled aster (*Aster simplex*), blue flag (*Iris virginica*), Canada goldenrod (*Solidago canadensis*), spotted joe-pye-weed (*Eupatorium maculatum*), broad-leaved cat-tail (*Typha latifolia*), and swamp

milkweed (*Asclepias incarnata*). Reed canary grass (*Phalaris arundinacea*) may be dominant in grazed and/or ditched stands. Ditched stands can succeed quickly to Shrub-Carr.

Our data files also contain historical records (generally, records that are 25 years old or older) of rare species known to occur within the vicinity of the project site. Unfortunately, the Bureau does not have more current survey information documenting the continued existence of this species in this area. These older records are included, however, as an indication of species which may occur in the project area if appropriate habitat still exists:

- **Prairie Vole** (*Microtus ochrogaster*), a state Special Concern mammal. This species is found in dry grassy areas along fence lines and in open fields; sandy prairies and slopes, especially if weed or grass grown; abandoned farm fields; seldom in sparsely wooded areas. Preferred habitat seems to be native prairie sod, of which there is little left in the State. It avoids marshes and wet places. Semi-colonial, this species breeds throughout the year with a peak in July, August and September.
- **Prairie false-dandelion** (*Nothocalais cuspidata*), a plant of Special Concern in Wisconsin, prefers dry, rock prairie bluffs and gravelly hillsides. Blooming occurs from early May through mid-June. Optimal identification period is from early May to mid-June.
- **Giant yellow hyssop** (*Agastache nepetoides*), a plant listed as Threatened in Wisconsin, prefers woodlands and forest edges, thickets, and river margins. Flowering occurs from early June through mid-October. Optimal identification period is from mid-July to late September.
- **Pale-purple coneflower** (*Echinacea pallida*), a plant listed as Threatened in Wisconsin, prefers prairies and prairie remnants along roads and railroads. Blooming occurs from early June through mid-July. Optimal identification period is from early June to mid-August.
- **Slim-stem small-reedgrass** (*Calamagrostis stricta*), a plant of Special Concern in Wisconsin, prefers dry to moist dunes, barrens, and dolomite or sandstone ledges, mostly near the Great Lakes, and also calcareous wetlands. Blooming occurs throughout the month of June. Optimal identification period is from early July to late August.
- **Small white lady's slipper** (*Cypripedium candidum*), a plant listed as Threatened in Wisconsin, prefers calcareous wet fens and prairies. Blooming occurs from mid-May through mid-June. Optimal identification period is from mid-May through mid-June.
- **Purple milkweed** (*Asclepias purpurascens*), a plant listed as Endangered in Wisconsin, prefers open oak forest margins and roadsides, and has wide soil moisture tolerances. Blooming occurs from early June through late July. Optimal identification period is from mid-June to late July.
- **One-flowered broomrape** (*Orobanche uniflora*), a plant of Special Concern in Wisconsin, this saprophytic species prefers mesic woods and blooms from May to June.
- **American fever-few** (*Parthenium integrifolium*), a plant listed as Threatened in Wisconsin, prefers prairies and remnants along roads and railroads; it can be difficult to tell whether the plant is native or has been planted. Blooming occurs from mid-June through mid-September. Optimal identification period is from mid-July to late September.
- **Prairie parsley** (*Polytaenia nuttallii*), a plant listed as Threatened in Wisconsin, prefers mesic prairies, and persists in open areas that were savannas. Blooming occurs from early May through late June. Optimal identification period is from early May to late August.
- **Snowy campion** (*Silene nivea*), a plant listed as Threatened in Wisconsin, prefers alluvial deciduous forest margins and meadows, streambanks, wooded ravines, and calcareous fens.

Blooming occurs from mid-June through late July. Optimal identification period is from mid-June to late July.

- **Pale bulrush** (*Scirpus pallidus*), a plant of Special Concern in Wisconsin, prefers forest and marsh ecotones. Blooming occurs throughout the month of July. Optimal identification period is from early August to late September.

Endangered and Threatened species are provided protection under the Wisconsin Endangered Species Law (29.604 State Stats.). Special Concern (Watch) species are those about which some problem of abundance or distribution is suspected but not yet proved. The main purpose of this category is to focus attention on certain species before they become endangered or threatened.

Comprehensive endangered resource surveys have not been completed for the project area. As a result, our data files may be incomplete. **The lack of additional known occurrences does not preclude the possibility that other endangered resources may be present.** Occurrences of rare species are only in our NHI database if the site has been previously surveyed for that species or group during the appropriate season, and an observation was reported and entered into the database. As such, absence of an NHI occurrence in a specific area should not be used to infer absence of rare species. Evaluations of the possible presence of rare species on the project site should be based on whether suitable habitat for the species exists within the project area.

Follow-up Actions:

1) Eleven **plant species** have been recorded within the vicinity of the project area and may occur on site if suitable habitat exists. If any on the endangered/threatened plants are present on private land I recommend you avoid impacts to these species. If any endangered/threatened plants are located on public property you *must avoid all impacts.*

   a) Three plant species (**Slim-stem small-reedgrass, Small white lady's slipper, Pale bulrush**) are dependant on wetland habitat which the project boundaries contain. Extra caution should be used when developing in the northeastern portion of the boundaries.

   b) I suggest **surveys** be conducted for the eleven plant species in areas of suitable habitat to confirm presence or absence. Please contact our office for information on survey protocols if necessary.

2) Because this project site may contain **wetland communities (Calcareous Fen, Shrub-carr, Southern Sedge Meadow)**, it is recommended that **erosion and siltation controls** be practiced during any future development.

   a) If and when these procedures are implemented, please note that erosion control netting (also known as erosion control blankets, erosion mats or erosion mesh netting) used to prevent erosion during the establishment of vegetation can have detrimental effects on local snake and other wildlife populations. Plastic netting without independent movement of strands can easily entrap snakes moving through the area, leading to dehydration, desiccation, and eventually mortality. Netting that contains biodegradable thread with the "leno" or "gauze" weave (contains strands that are able to move independently) appears to have the least impact on snakes.

   b) Due to the presence of three **natural communities** (Calcareous Fen, Shrub-carr, Southern Sedge Meadow), consider minimizing impacts to these areas as well as incorporating buffers along the edges of these areas if present. A community is an assemblage of plant and animal species within a specific habitat. Communities may be named for their dominant plant species (for example, pine barrens, sedge meadows, and oak savannas), a prominent environmental feature (Great Lakes Dune, Dry Cliff), or some combination of these factors. Communities range

in size from less than an acre to thousands of acres. The Natural Heritage Inventory Program tracks examples of all types of Wisconsin's natural communities that are deemed significant because of their undisturbed condition, size, what occurs around them, or for other reasons. **Natural communities may contain rare or declining species and their protection should be incorporated into the project design as much as possible.**

4) The **Prairie Vole** is a historic record from the project area. This species is found in dry grassy areas along fence lines and in open fields; sandy prairies and slopes, especially if weed or grass grown; abandoned farm fields; seldom in sparsely wooded areas. Since the project site does not look to contain suitable habitat it is unlikely this vole is present. However, it may be present in surrounding areas with more suitable habitat. To minimize impact to surrounding habitat I recommend the limited use of chemicals and pesticides, including diazinon, on grassland habitats because of their known negative affects on reproduction and other aspects of small mammal biology.

5) The **Waubesa Wetlands** (SNA) is located within 2 miles of the project site. Located in an old lobe of Lake Waubesa along its southwest shore, Waubesa Wetlands is one of the highest quality and most diverse wetlands remaining in southern Wisconsin. Nine major springs and numerous smaller ones located within and around the area provide the wetland with an abundance of high quality water. Because this State Natural Area is not directly adjacent to your development project, I do not expect any impacts to the SNA as a result of project related disturbance. However, a SNA within close proximity may indicate increased biodiversity within the project site.

The specific location of endangered resources is sensitive information that has been provided to you for the analysis and review of this project. Exact locations should not be released or reproduced in any publicly disseminated documents.

This letter is for informational purposes and only addresses endangered resource issues. This letter does not constitute Department of Natural Resources authorization of the proposed project and does not exempt the project from securing necessary permits and approvals from the Department.

Please contact me at (608) 266-5241 if you have any questions about this information.

Sincerely,

Angela Engelman

Angela Engelman, ER/6
Endangered Resources Program

cc: Cathy Bleser – SCR/Fitchburg
Cami Peterson – SCR/Fitchburg
Eric Rortvedt – SCR/Fitchburg
Laura Madsen – SCR/Fitchburg

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ATTACHMENT E

Community 1 Herbaceous Layer Quadrat Data Summary

Northeast Neighborhood Plan
Community 1 Quadrat Data Summary

Species Name	Common Name	Frequency	Average % Cover
Circaea lutetiana	broad-leaf enchanter's-nightshade	89%	8.4
Bare Ground/ Non-vegetated		65%	43.6
ALLIARIA PETIOLATA	garlic mustard	48%	25.4
RHAMNUS CATHARTICA	common buckthorn	38%	2.5
Geranium maculatum	wild geranium	23%	7.8
Geum canadense	white avens	23%	0.9
Parthenocissus quinquefolia	Virginia creeper	21%	0.8
Arisaema triphyllum	Jack-in-the-pulpit	18%	1.3
LONICERA X BELLA	Bell's honeysuckle	18%	1.4
Podophyllum peltatum	may-apple	16%	3.9
Galium aparine	sticky-willy	13%	0.8
HESPERIS MATRONALIS	dame's rocket	10%	0.9
Rubus occidentalis	black raspberry	8%	0.8
Viola sororia	door-yard violet	8%	0.5
Geum aleppicum	yellow avens	8%	0.6
Coarse Woody Debris		8%	4.2
Acer negundo	box elder	6%	0.1
ARCTIUM MINUS	common burdock	5%	0.8
Geum laciniatium	rough avens	5%	0.2
Prunus serotina	wild black cherry	5%	0.1
Rubus idaeus var. strigosus	American red raspberry	5%	0.3
Trillium grandiflorum	big white trillium	5%	0.1
Urtica dioica	stinging nettle	5%	0.4
LEONURUS CARDIACA	motherwort	5%	0.4
Carex rosea	stellate sedge	4%	0.4
Oxalis stricta	common yellow oxalis	4%	0.1
Vitis riparia	river bank grape	4%	0.1
Acer rubrum	red maple	3%	0.0
Athyrium filix-femina	lady fern	3%	0.2
Carya ovata	shagbark hickory	3%	0.0
Celtis occidentalis	northern hackberry	3%	0.1
SOLANUM DULCAMARA	bittersweet nightshade	3%	0.0
Streptopus lanceolatus	twisted-stalk	3%	0.2
GLECHOMA HEDERACEA	creeping-Charlie	3%	0.1
Onoclea sensibilis	sensitive fern	1%	0.5
PHALARIS ARUNDINACEA	reed canary grass	1%	0.1
ROSA MULTIFLORA	multiflora rose	1%	0.1

ATTACHMENT F

Heritage and Specimen Trees

Northeast Neighborhood Plan
Heritage and Specimen Trees

Tree Number	Common Name	Species Name	DBH	Health Notes
HT-1	*Quercus macrocarpa*	bur oak	39	Healthy
HT-2	*Quercus alba*	white oak	39	Healthy
HT-3	*Quercus alba*	white oak	50.5	Large, mulit-forked, healthy canopy tree
HT-4	*Populus deltoides*	plains cottonwood	51	Healthy
HT-5	*Quercus rubra*	northern red oak	48	Healthy
HT-6	*Quercus rubra*	northern red oak	39	Healthy
HT-7	*Acer saccharinum*	silver maple	52	Healthy
ST-01	*Quercus rubra*	northern red oak	35.2	Healthy
ST-02	*Quercus rubra*	northern red oak	35	Healthy
ST-03	*Quercus macrocarpa*	bur oak	35.5	Some dead branches; old tree stand at fork; large knots
ST-04	*Quercus alba*	white oak	33	Healthy
ST-05	*Quercus alba*	white oak	29	Healthy
ST-06	*Quercus alba*	white oak	32.5	Healthy
ST-07	*Quercus macrocarpa*	bur oak	34.5	Healthy; Deer stand in tree
ST-08	*Quercus macrocarpa*	bur oak	36	Healthy
ST-09	*Quercus macrocarpa*	bur oak	34.5	Healthy
ST-10	*Quercus rubra*	northern red oak	33	Healthy; frost crack on side
ST-11	*Quercus rubra*	northern red oak	34	healthy
ST-12	*Quercus rubra*	northern red oak	37	healthy
ST-13	*Quercus macrocarpa*	bur oak	34	Healthy
ST-14	*Quercus alba*	white oak	33	Healthy
ST-15	*Quercus rubra*	northern red oak	34	Potenial rot at base from damage by fallen tree
ST-16	*Quercus rubra*	northern red oak	33 & 27.5	Two healthy basal sprouts
ST-17	*Quercus rubra*	northern red oak	36	Healthy
ST-18	*Quercus rubra*	northern red oak	35	Healthy
ST-19	*Quercus rubra*	northern red oak	38	Healthy
ST-20	*Quercus rubra*	northern red oak	37	Healthy
ST-21	*Quercus macrocarpa*	bur oak	35	Healthy
ST-22	*Quercus macrocarpa*	bur oak	33	Healthy
ST-23	*Quercus rubra*	northern red oak	36	Healthy; few small cankers

ATTACHMENT G

Wildlife Species

Northeast Neighborhood
Wildlife Species Potentially Occurring in the Project Area

REPTILES AND AMPHIBIANS	
Common Name	**Scientific Name**
Northern Brown Snake	Storeria dekayi
Northern Red Bellied Snake	Storeria occipitomaculata
Eastern Plains Garter Snake	Thamnophis radix radix
Common Garter Snake	Thamnophis sirtalis
Western Fox Snake	Elaphe vulpina vulpina
Eastern Milk Snake	Lampropeltis triangulum
Blue Spotted Salamander	Ambystoma laterale
Eastern Tiger Salamander	Ambystoma tigrinum tigrinum
American Toad	Bufo americanus
Gray Tree Frog	Hyla versicolor
Wood Frog	Rana sylvantica
BIRDS	
Common Name	**Scientific Name**
Wood Duck	Aix sponsa
Turkey Vulture	Cathartes aura
Cooper's Hawk	Accipiter cooperli
Sharp-Shinned Hawk	Accipiter striatus
Red Tailed Hawk	Buteo jamaicensis
Broad-Winged Hawk	Buteo platypterus
Wild Turkey	Meleagris gallopavo
Mourning Dove	Zenaida macroura
Yellow Billed Cuckoo	Coccyzus americanus
Black Billed Cuckoo	Coccyzus erythropthalmus
Screech Owl	Otus asio
Great Horned Owl	Bubo virginianus
Barred Owl	Strix varia
Saw-Whet Owl	Aegolius acadicus
Whip-Poor-Will	Caprimulgus vociferus
Common Nighthawk	Chordeiles minor
Chimney Swift	Chaetura pelagica
Ruby-Throated Hummingbird	Archilochus colubris
Common Flicker	Colaptes auratus
Pileated Woodpecker	Dryocopus pileatus
Red Bellied Woodpecker	Melanerpes carolinus
Yellow Bellied Sapsucker	Sphyrpicus varius
Harry Woodpecker	Picoides villosus
Downy Woodpecker	Picoides pubescens
Great Crested Flycatcher	Myiarchus crinitus
Eastern Phoebe	Sayomis phoebe
Least Flycatcher	Empidonax minimum
Eastern Wood-Pewee	Conopus virens
Tree Swallow	Iridoprocne bicolor
Rough Winged Swallow	Stelgidopteryx ruficollis
Blue Jay	Cyanocitta cristata
Cornmon Crow	Corvus brachryhynochos

Northeast Neighborhood
Wildlife Species Potentially Occurring in the Project Area

BIRDS	
Common Name	**Scientific Name**
Black Capped Chickadee	Parus atricapillus
Tufted Titmouse	karus bicolor
White Breasted Nuthatch	Sitta carolinensis
Brown Creeper	Certhia familiaris
House Wren	Troglodytes aedon
Gray Catbird	Dumetella carolinensis
Brown Thrasher	Toxostoma rulum
Robin	Turdus migratorius
Wood Thrush	Hylocichla mustelina
Veery	Catharus fuscenscens
Blue Gray Gnatcatcher	Polioptila caerulea
European Starling	Sturnus vulgaris
Yellow Throated Vireo	Vireo flavifrons
Red Eyed Vireo	Vireo olivaceus
Black-And-White Warbler	Mniotilta varia
Golden-Winged Warbler	Vermivora chrysoptera
Tennessee Warbler	Vermivora peregrina
Nashville Warbler	Vermivora ruficapilla
Black-Throated Green Warbler	Dendroica virens
Cerulean Warbler	Dendroica cerulea
Chestnut-Sided Warbler	Dendroica pensylvanica
Pine Warbler	Dendroica pinus
Ovenbird	Seiurus aurocapillus
Wilson's Warbler	Wilsonia pusilla
Canada Warbler	Wilsonia canadensis
American Redstart	Setophaga ruticilla
House Sparrow	Passer domesticus
Common Grackle	Quiscalus quiscula
Brown Headed Cowbird	Molothrus ater
Northern Oriole	Icterus galbula
Scarlet Tanager	Piranga olivacea
Northern Cardinal	Cardinalis cardinalis
Rose-Breasted Grosbeak	Pheucticus ludovivianus
Evening Grosbeak	Hesperiphona vespertina
Indigo Bunting	Passerina cyanea
Purple Finch	Carpodacus purpureus
Pine Siskin	Carduelis pinus
American Goldfinch	Carduelis tristis
Rufous-Sided Towhee	Pipilo erythrophalmus
Sharp-Tailed Sparrow	Ammospiza caudacuta
Slate-Colored Junco	Junco hyemalis
Chipping Sparrow	Spizella passerina
White-Throated Sparrow	Zonotrichia albicollis
Fox Sparrow	Passerella iliaca
Song Sparrow	MMelospiza melodia

Northeast Neighborhood
Wildlife Species Potentially Occurring in the Project Area

MAMMALS	
Common Name	**Scientific Name**
Opossum	Didelphis marsupialis
Eastern Mole	Scalopus aquaticus
Little Brown Bat	Myotis lucifugus
Eastern Long-Eared Bat	Myotis keenii
Big Brown Bat	Eptesicus fuscus
Red Bat	Lasiurus borealis
Hoary Bat	Lasiurus cinereus
Eastern Pipistrelle	Pipistrellus sublavus
Cottontail Rabbit	Sylvaugus flordanus
Woodchuck	Marmota monax
Eastern Chipmunk	Tamias striatus
Gray Squirrel	Sciurus carolinensis
Fox Squirrel	Sciurus niger
Southern Flying Squirrel	Glaucomys volans
Northern White-Footed Mouse	Peromyscus leucopus
Woodland Vole	Microtus pinetorum
Common Rat	Rattus rattus
House Mouse	Mus musculus
Coyote	Canis latrans
Red Fox	Vuples fulva
Gray Fox	Urocyon cinereoargenteus
Raccoon	Procyon lotor
Short-Tailed Weasel	Mustela erminea
Long-Tailed Weasel	Mustela frenata
Least Weasel	Mustela nivalis
Striped Skunk	Mephitis mephitis
White-Tailed Deer	Odocoileus virginianus

ATTACHMENT H

Raw Quadrat Data

Northeast Neighborhood
Community 1: Raw Quadrat Data

Species Name	Common Name	1-8N	1-8E	1-8S	1-8W	1-9N	1-9E	1-9S	1-9W	1-10N	1-10E	1-10S	1-10W	1-11N	1-11E	1-11S	1-11W
Acer negundo	box elder			1													
Acer rubrum	red maple								1								
ALLIARIA PETIOLATA	garlic mustard														1		1
Ambrosia trifida	giant ragweed																
ARCTIUM MINUS	common burdock																
Arisaema triphyllum	Jack-in-the-pulpit								1								
Athyrium filix-femina	lady fern																
Carex rosea	stellate sedge	30	1	1													
Carya ovata	shagbark hickory																
Celtis occidentalis	northern hackberry		1														
Circaea lutetiana	broad-leaf enchanter's-nightshade			5	1	15	10	1	5		5		1	1	5	1	1
Galium aparine	sticky-willy			1													
Geranium maculatum	wild geranium	5	5														
Geum canadense	white avens	1	5	5	10					1	1		1		1		
Geum laciniatum	rough avens																
HESPERIS MATRONALIS	dame's rocket																
LONICERA X BELLA	Bell's honeysuckle								1	5		5					
Onoclea sensibilis	sensitive fern																
Oxalis stricta	common yellow oxalis																
Parthenocissus quinquefolia	Virginia creeper					1	1	1		1							
Podophyllum peltatum	may-apple	30						5	10								
Prunus serotina	wild black cherry									1							
Quercus rubra	northern red oak																
RHAMNUS CATHARTICA	common buckthorn	10			1	10	1	1	20	1	30	5		1	5		
Rubus allegheniensis	Allegheny blackberry																
Rubus idaeus var. strigosus	American red raspberry																
Rubus occidentalis	black raspberry																
SOLANUM DULCAMARA	bittersweet nightshade																
Streptopus lanceolatus	twisted-stalk																
TARAXACUM OFFICINALE	common dandelion																
Trillium grandiflorum	big white trillium																
Ulmus americana	American elm																
Viola sororia	door-yard violet												1				
Vitis riparia	river bank grape																
Geum aleppicum	yellow avens																
Urtica dioica	stinging nettle																
LEONURUS CARDIACA	motherwort																
PHALARIS ARUNDINACEA	reed canary grass																
GLECHOMA HEDERACEA	creeping-Charlie																
ROSA MULTIFLORA	multiflora rose																
Coarse woody Debris										60		75					
non-vegetated/bare ground		30	90	90	90	80	90	95	65	40	70	15	95	100	85	100	100

Northeast Neighborhood
Community 1: Raw Quadrat Data

Species Name	Common Name	1-16N	1-16E	1-16S	1-16W	1-15N	1-15E	1-15S	1-15W	1-12N	1-12E	1-12S	1-12W	1-14N	1-14E	1-14S	1-14W
Acer negundo	box elder										5						
Acer rubrum	red maple																
ALLIARIA PETIOLATA	garlic mustard					60											
Ambrosia trifida	giant ragweed																
ARCTIUM MINUS	common burdock																
Arisaema triphyllum	Jack-in-the-pulpit														5		
Athyrium filix-femina	lady fern																
Carex rosea	stellate sedge																
Carya ovata	shagbark hickory																
Celtis occidentalis	northern hackberry																
Circaea lutetiana	broad-leaf enchanter's-nightshade	1	25	10	5	10	15	10	15	15	1	1	5	5	10	10	
Galium aparine	sticky-willy																5
Geranium maculatum	wild geranium			5	5						50		1				
Geum canadense	white avens		1		5												
Geum laciniatum	rough avens																
HESPERIS MATRONALIS	dame's rocket																
LONICERA X BELLA	Bell's honeysuckle					10							5	15		5	
Onoclea sensibilis	sensitive fern																40
Oxalis stricta	common yellow oxalis				1			5	5								
Parthenocissus quinquefolia	Virginia creeper								5	1	1	5		10			15
Podophyllum peltatum	may-apple				50												
Prunus serotina	wild black cherry									1						1	
Quercus rubra	northern red oak																
RHAMNUS CATHARTICA	common buckthorn						5			15	1	10	5			10	5
Rubus allegheniensis	Allegheny blackberry																
Rubus idaeus var. strigosus	American red raspberry					5											
Rubus occidentalis	black raspberry						5										
SOLANUM DULCAMARA	bittersweet nightshade													1		1	
Streptopus lanceolatus	twisted-stalk																
TARAXACUM OFFICINALE	common dandelion																
Trillium grandiflorum	big white trillium								1								
Ulmus americana	American elm																
Viola sororia	door-yard violet															15	
Vitis riparia	river bank grape						1	1	5								
Geum aleppicum	yellow avens																
Urtica dioica	stinging nettle																
LEONURUS CARDIACA	motherwort																
PHALARIS ARUNDINACEA	reed canary grass																
GLECHOMA HEDERACEA	creeping-Charlie																
ROSA MULTIFLORA	multiflora rose																
Coarse woody Debris														60	60	40	40
non-vegetated/bare ground		100	80	85	40	20	85	85	75	70	50	80	80	10	30	20	

Northeast Neighborhood

Community 1: Raw Quadrat Data

Species Name	Common Name	1-13N	1-13E	1-13S	1-13W	1-1N	1-1E	1-1S	1-1W	1-2N	1-2E	1-2S	1-2W	1-3N	1-3E	1-3S	1-3W
Acer negundo	box elder	1								1							
Acer rubrum	red maple																
ALLIARIA PETIOLATA	garlic mustard									40	15		70	70	60		70
Ambrosia trifida	giant ragweed																
ARCTIUM MINUS	common burdock																
Arisaema triphyllum	Jack-in-the-pulpit						5			1	5				1		
Athyrium filix-femina	lady fern																
Carex rosea	stellate sedge																
Carya ovata	shagbark hickory							1									
Celtis occidentalis	northern hackberry																
Circaea lutetiana	broad-leaf enchanter's-nightshade	15	1	5	15		5	1	5	25	10	10	15	5	5	10	10
Galium aparine	sticky-willy													5			
Geranium maculatum	wild geranium					80	85	80	70	15	80	90	10				
Geum canadense	white avens	5					1							1		5	
Geum laciniatum	rough avens																
HESPERIS MATRONALIS	dame's rocket					15	1		10		5	10					
LONICERA X BELLA	Bell's honeysuckle			5										10			
Onoclea sensibilis	sensitive fern																
Oxalis stricta	common yellow oxalis																
Parthenocissus quinquefolia	Virginia creeper	1	1												5		
Podophyllum peltatum	may-apple						20	25				5	5	15			10
Prunus serotina	wild black cherry																
Quercus rubra	northern red oak																
RHAMNUS CATHARTICA	common buckthorn	5			1		1	10	1			5	10				
Rubus allegheniensis	Allegheny blackberry																
Rubus idaeus var. strigosus	American red raspberry														1	10	
Rubus occidentalis	black raspberry					20			10					10			10
SOLANUM DULCAMARA	bittersweet nightshade																
Streptopus lanceolatus	twisted-stalk																
TARAXACUM OFFICINALE	common dandelion																
Trillium grandiflorum	big white trillium																
Ulmus americana	American elm																
Viola sororia	door-yard violet																
Vitis riparia	river bank grape																
Geum aleppicum	yellow avens																
Urtica dioica	stinging nettle																
LEONURUS CARDIACA	motherwort																
PHALARIS ARUNDINACEA	reed canary grass																
GLECHOMA HEDERACEA	creeping-Charlie																
ROSA MULTIFLORA	multiflora rose																
Coarse woody Debris																	
non-vegetated/bare ground		80	100	90	85					10					30	80	

Northeast Neighborhood
Community 1: Raw Quadrat Data

Species Name	Common Name	1-18N	1-18E	1-18S	1-18W	1-17N	1-17E	1-17S	1-17W	1-20N	1-20E	1-20S	1-20W	1-19N	1-19E	1-19S	1-19W
Acer negundo	box elder											1					
Acer rubrum	red maple								1								
ALLIARIA PETIOLATA	garlic mustard	5	15		5			100	1	90	90	85	90	85	85	60	90
Ambrosia trifida	giant ragweed																
ARCTIUM MINUS	common burdock									30	5					1	
Arisaema triphyllum	Jack-in-the-pulpit													1		15	
Athyrium filix-femina	lady fern																
Carex rosea	stellate sedge																
Carya ovata	shagbark hickory	1															
Celtis occidentalis	northern hackberry			5													
Circaea lutetiana	broad-leaf enchanter's-nightshade	10	10	15	15	15	15		5	5			1	5	5	15	10
Galium aparine	sticky-willy									10	10	10	5		1		
Geranium maculatum	wild geranium		25	5											5		5
Geum canadense	white avens		10		5		5						5				
Geum laciniatium	rough avens																
HESPERIS MATRONALIS	dame's rocket																
LONICERA X BELLA	Bell's honeysuckle	1	20	10				1									
Onoclea sensibilis	sensitive fern																
Oxalis stricta	common yellow oxalis																
Parthenocissus quinquefolia	Virginia creeper																
Podophyllum peltatum	may-apple			20													
Prunus serotina	wild black cherry				5												
Quercus rubra	northern red oak																
RHAMNUS CATHARTICA	common buckthorn	1															
Rubus allegheniensis	Allegheny blackberry																
Rubus idaeus var. strigosus	American red raspberry														10		
Rubus occidentalis	black raspberry																
SOLANUM DULCAMARA	bittersweet nightshade																
Streptopus lanceolatus	twisted-stalk																
TARAXACUM OFFICINALE	common dandelion																
Trillium grandiflorum	big white trillium					1	1		1								
Ulmus americana	American elm																
Viola sororia	door-yard violet									10	5	5					
Vitis riparia	river bank grape																
Geum aleppicum	yellow avens					15								1		10	15
Urtica dioica	stinging nettle						15			5		5	5				
LEONURUS CARDIACA	motherwort									15		10	1				
PHALARIS ARUNDINACEA	reed canary grass											5					
GLECHOMA HEDERACEA	creeping-Charlie											10	1				
ROSA MULTIFLORA	multiflora rose																
Coarse woody Debris																	
non-vegetated/bare ground		80	25	60	75	75	70		100								

Northeast Neighborhood

Community 1: Raw Quadrat Data

Species Name	Common Name	1-4N	1-4E	1-4S	1-4W	1-5N	1-5E	1-5S	1-5W	1-6N	1-6E	1-6S	1-6W	1-7N	1-7E	1-7S	1-7W
Acer negundo	box elder																
Acer rubrum	red maple																
ALLIARIA PETIOLATA	garlic mustard	60	40	90	90	60	30	90	90	80	15	95	40	20	5	5	35
Ambrosia trifida	giant ragweed																
ARCTIUM MINUS	common burdock		30														
Arisaema triphyllum	Jack-in-the-pulpit		10	5			15	20			15		5				
Athyrium filix-femina	lady fern													10	5		
Carex rosea	stellate sedge																
Carya ovata	shagbark hickory																
Celtis occidentalis	northern hackberry																
Circaea lutetiana	broad-leaf enchanter's-nightshade	15	15	15	10	20	20	5	20	20	20	10	1	15	10	20	5
Galium aparine	sticky-willy							5	10								
Geranium maculatum	wild geranium																
Geum canadense	white avens																
Geum laciniatum	rough avens							1	5					5			5
HESPERIS MATRONALIS	dame's rocket	5		15	10												
LONICERA X BELLA	Bell's honeysuckle														20		
Onoclea sensibilis	sensitive fern																
Oxalis stricta	common yellow oxalis																
Parthenocissus quinquefolia	Virginia creeper						1				1		15	1			
Podophyllum peltatum	may-apple					60	60										
Prunus serotina	wild black cherry																
Quercus rubra	northern red oak																
RHAMNUS CATHARTICA	common buckthorn				1	5			10							10	
Rubus allegheniensis	Allegheny blackberry																
Rubus idaeus var. strigosus	American red raspberry																
Rubus occidentalis	black raspberry				5												
SOLANUM DULCAMARA	bittersweet nightshade																
Streptopus lanceolatus	twisted-stalk									15	1						
TARAXACUM OFFICINALE	common dandelion																
Trillium grandiflorum	big white trillium																
Ulmus americana	American elm																
Viola sororia	door-yard violet	1															
Vitis riparia	river bank grape																
Geum aleppicum	yellow avens		5	5													
Urtica dioica	stinging nettle																
LEONURUS CARDIACA	motherwort										5						
PHALARIS ARUNDINACEA	reed canary grass																
GLECHOMA HEDERACEA	creeping-Charlie																
ROSA MULTIFLORA	multiflora rose		10														
Coarse woody Debris																	
non-vegetated/bare ground		20									50		50	55	65	80	65

Northeast Neighborhood

Community 2: Raw Quadrat Data

Species Name	Common Name	2-1N	2-1E	2-1S	2-1W	2-1N	2-2E	2-2S	2-2W
ARCTIUM MINUS	common burdock		1						
Arisaema triphyllum	Jack-in-the-pulpit							1	
Carya ovata	shagbark hickory					1	1	1	1
Circaea lutetiana	broad-leaf enchanter's-nightshade	35	35	25	10	25	60	50	40
Galium aparine	sticky-willy								5
Geum canadense	white avens						1		1
Prunus serotina	wild black cherry			1					
Quercus rubra	northern red oak	1							
RHAMNUS CATHARTICA	common buckthorn				1	15		10	
Rubus allegheniensis	Allegheny blackberry						5		
Rubus idaeus var. strigosus	American red raspberry		1			10		1	10
SOLANUM DULCAMARA	bittersweet nightshade		5					1	
TARAXACUM OFFICINALE	common dandelion			1					
Ulmus americana	American elm			1	1		1		
non-vegetated/bare ground		70	70	80	90	60	20	20	40

Northeast Neighborhood

Community 3: Raw Quadrat Data

Species Name	Common Name	3-1N	3-1E	3-1S	3-1W
Acer rubrum	red maple	1	1		1
Ambrosia trifida	giant ragweed			1	
Carex rosea	stellate sedge		10		
Circaea lutetiana	broad-leaf enchanter's-nightshade			10	10
Galium aparine	sticky-willy		5		
Geum canadense	white avens	5	5	5	5
Quercus rubra	northern red oak			1	
RHAMNUS CATHARTICA	common buckthorn	5	25	25	40
TARAXACUM OFFICINALE	common dandelion	1			
Viola sororia	door-yard violet	25	15	10	20
ROSA MULTIFLORA	multiflora rose	10		5	
Coarse woody Debris		10			
non-vegetated/bare ground		45	40	50	30